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Exit, the automobile motor

1916

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February, 1916

**MOTOR  
BOATING**

Vol. XVII, No. 2

**THE NATIONAL MAGAZINE OF MOTOR BOATING**

Entered as second-class matter at New York, N. Y., Post Office.

Copyright, 1916, by International Magazine Co. (MoToR BoatinG).

Published Monthly by International Magazine Company, 119 West Fortieth Street, New York City

G. L. Willson, President

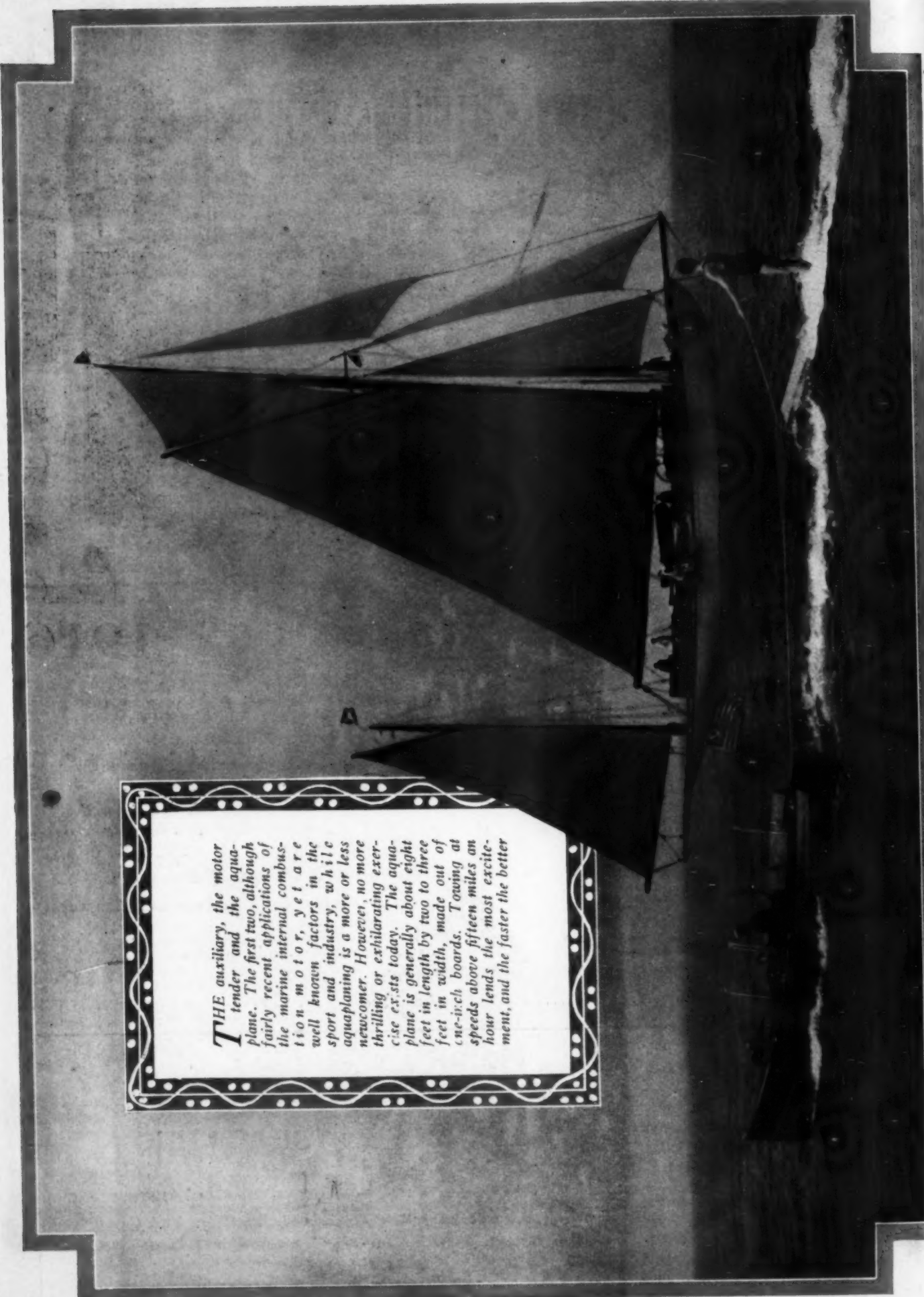
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15 cents a copy. Subscription, \$1.00 a year. Extra Canadian postage, 50 cents. Extra foreign postage, \$1.00.



**T**HE auxiliary, the motor tender and the aquaplane. The first two, although fairly recent applications of the marine internal combustion motor, yet are well known factors in the sport and industry, while aquaplaning is a more or less newcomer. However, no more thrilling or exhilarating exercise exists today. The aquaplane is generally about eight feet in length by two to three feet in width, made out of one-inch boards. Towing at speeds above fifteen miles an hour lends the most excitement, and the faster the better





## The First Palace Show

**This Big Attractive Exhibition in New and More Wholesome Surroundings is an Augury for an Active, Prosperous Season—The Advance in the Industry of the Last Twelve Months**

**A**TENTION last year was divided between two shows—the one held in New York at the Garden and the one at Chicago's big Coliseum. This arrangement had its advantages both from the exhibitor's and from the boatman's standpoints, but it also meant that certain prominent exhibitors stayed away from one show or the other so that the fan had to take in both to be sure of missing nothing. This year, however, the National Association of Boat & Engine Manufacturers has centered all its efforts on the one big New York affair, and the spectator may be sure after a visit to the Palace that he has missed nothing in the 1916 exhibition line. And in choosing the Palace for the big show the Association has shown excellent taste. Of course, the old Garden is wrapped about with memories of former shows, but it is also noticeably reminiscent of past circuses, while the air at the Palace is much more of a sort with the ozone which the motor boatman habitually breathes.

As in former years, a great effort has been made to make the 1916 show a real boat show and not a display solely of engines and accessories. The result has been very satisfactory, and we find on the main floor pleasure boats of practically every sort from the small outboard motor rowboat which has made such rapid strides in popularity the last twelve months to the exquisitely finished 60-foot cruising yacht.

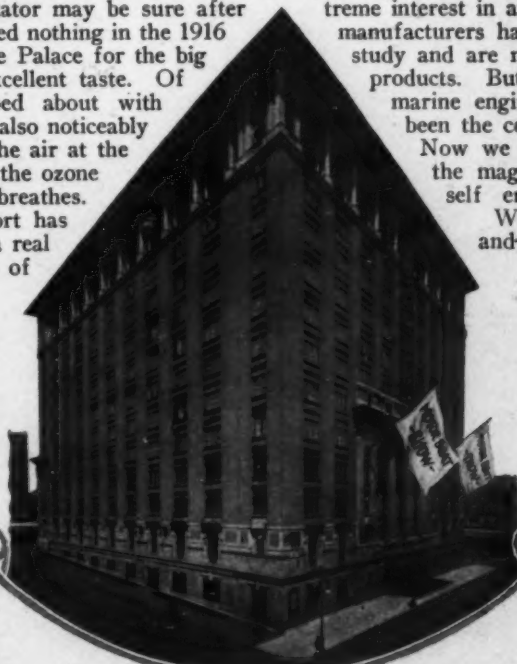
Neither have the engines been neglected. It is not, we think, stretching a point to say that

there has been more progress in the design of marine motors since the Garden closed its doors in 1915 than in any other period of similar length since the birth of the industry. Aluminum pistons, against which a good deal of disapprobation had been directed, proved their worth in high speed practice and are being fitted now in more than one "de luxe" power plant for other than racing work. The matter of balancing crankshafts to eliminate vibration and thereby reduce friction and increase power has been a point of extreme interest in automobile practice, and several marine manufacturers have given the subject a great deal of study and are making the necessary changes in their products. But the most noticeable improvement in marine engine practice during the last year has been the complete enclosure of all moving parts.

Now we have not only the valve tappets, but the magneto shaft and even the flywheel itself encased in metal plates and forms.

With a multitude of improvements, large and small, effected in the design of hull and power plant, together with the era of general prosperity which seems to be upon us, it is but natural that those in charge should predict that this big show which is just now opening its doors will prove more successful than any of its predecessors. In this issue, on pages 24 to 38, will be found full descriptions of the exhibits of boat, engine and accessory manu-

facturers who have taken space within the four walls of the Grand Central Palace.



*The New Home  
of the Motor Boat Show*

# Where Shall We Cruise Next Summer?

## Lake Champlain No. 2

By R. A. Langworthy

THE man who is contemplating a cruise next summer, either short or long, will do well to consider the possibilities of Lake Champlain as the scene of his activities. This splendid sheet of water has been aptly described by one writer as "The queen of inland seas and the yachtsman's paradise," and has figured prominently in the annals of American history since its discovery by Samuel De Champlain in 1609.

The lake forms the boundary line between northern New York and Vermont, runs almost due north and south and is about 120 miles long and twelve miles in width at one point. Whitehall, the southern extremity of the lake, is

220 miles from New York City and seventy miles from Albany. The above general description will serve to locate the lake in the reader's mind. It is no mill pond, but a real body of water, and it is capable of kicking a man's size sea on proper occasions—a fact that should be kept in mind.

The writer has spent many pleasant summer vacations on Champlain, and about two years ago took a cruise of over three months during which the entire lake was explored. He will endeavor to give his brother boatmen who are considering such a cruise some information which it is hoped will prove of value.

The prevailing summer winds on the lake are northwest, west and south. The cruiser should be familiar with the signs and characteristics of these and learn to watch for them. A northwester is nearly always heralded by dark clouds in the northwest, which appear a little while before the storm starts. The squall is very apt to be sudden and violent. The clouds often obscure the sun and give the water an ugly and sinister appearance, while the wind whips up a nasty, choppy sea. The more violent storms are ordinary.

A bit of the shore line at the anchorage at Isle La Motte, Vt.

which cover the lake, as they cost only forty cents each, and will be found of great value. It is the writer's purpose to start at Whitehall and describe harbors, villages and points of interest on both sides of the lake in their order going north. It might be said here that while gasoline is procurable at the points specified, it will probably cost a fancy price at any except the following: Whitehall, Port Henry, Westport, Essex, Burlington, Plattsburgh, St. Albans and Rouses Point.

Whitehall is a good place to stock up on any supplies, provisions or gasoline necessary before proceeding up the lake. You can tie up above or below the lock. If you arrive late and are not going ahead until the next morning it will be



Southern  
Lake Champlain  
Isle La Motte



arily over in an hour or two, but a fairly heavy blow may last for twenty-four hours. The most treacherous squalls on the lake, as well as the hardest, come from the west and often with little or no warning. It is best to run for cover from a west wind, even with a fairly large boat. These winds are usually preceded by dull yellow or straw-colored clouds lying low over the hills, and rapidly growing darker as the storm breaks. West squalls do not last over an hour, except in very uncommon cases, but should be treated with healthy respect. The south wind will start gradually, generally at night, and blow for three or four days steadily. On the open stretches of the lake it will roll up a considerable sea and swells will be present for some time after the wind has subsided.

The majority of the cruisers will probably come from the south or the west, and in such cases Albany will be the actual starting point of the expedition. The distance from Albany to White Hall, by the Champlain Canal, is about seventy miles, and this can be covered in two days' easy running. A little courtesy to the lock tenders and a few cigars will help the progress considerably. By all means purchase the four splendid Government charts

This is the second of the series of articles which is appearing each month in MoToR Boating descriptive of the cruising possibilities of some of the waters of our country with which the average motor boatman is not familiar. Last month we cruised up the Potomac River and now the many advantages of Lake Champlain are brought out. In the next issue of MoToR Boating we shall take the motor boatman down to Maine's rock-bound coast where an entire summer can be spent to advantage among the countless islands.

Charts of Lake Champlain, three statute miles to the inch

best to tie up in the canal for the night and lock down in the morning.

The lower end of the lake from Whitehall to Ticonderoga does not offer any inducement for the cruiser to stop. It is narrow and winding, with many weeds on both sides, but the beacons are numerous and plain, so that navigation is easy. It is reputed to be good fishing ground. The only spot of interest which will be passed is the historic Narrows.

A stop should be made at Ticonderoga, on the west shore, to inspect the ruins of the old fort and the museum of relics in the restored barracks. Tie up at the steamboat dock at Monticarm Landing and walk up the railroad track and across fields to the fort. The small landing at the fort itself is not suitable for a boat of any size. Ticonderoga Creek enters the lake here flowing from Lake George, and is navigable for small boats for about a mile and a half.

Passing through the peculiar railroad swing bridge, the dock at Larabee Point is soon ahead on the east. It is not sheltered from the winds. Further north, on the west shore, are the old abandoned iron works at Crown Point village. The dock here offers a good place to tie up and is quiet for a night's rest, but no gas or supplies are available.

Next ahead on the west is Crown Point and on the east Chimney Point. Watch your charts and navigation here, for this point in the lake is an offset and puzzling to approach from either end, although it clears up readily enough when reached. A stop should be made to inspect the combined monument and

(Continued on page 64)



Motor Boatmen who make the Lake Champlain cruise always call at the St. John's Yacht Club, where a royal welcome awaits them



# The Passing of SEA CALL

Sea Call was the largest motor boat ever built. Her total length was 214 feet, her beam 33 feet, and her draft 18 feet. In addition to being the largest, Sea Call was without doubt the most costly. Nearly \$1,000,000 was the cost of hull, machinery and equipment, and not a dollar was spared to make her the last word in design and construction. Yet in spite of all of this fortune spent on Sea Call, her life was probably the shortest of any motor boat launched in recent years. It was hardly four months from the day she took her initial plunge until her owner ordered her to the scrap pile.

Galvanic action was the cause of all the trouble. The plates were monel metal and the framing was of steel. Most of the fastenings were reported to be of the former material, yet a few steel rivets found their way into the construction. A small leak caused by the eating away of a steel rivet was the first indication of trouble. This was replaced by another similar rivet which was quickly eaten away. And then a thorough investigation followed. It was found that the steel in the underwater sections had seriously corroded and was in such a dangerous condition that junking had to be resorted to.

By George S. Hudson

**W**HETHER Alexander S. Cochran's million dollar auxiliary schooner Sea Call is being scattered over Europe in shape of shrapnel is a mooted question. Neither can it be definitely stated that cannon engaged in knocking down defenses in the Near East are leavened with metal that once stiffened the magnificent floating palace designed and constructed with view to globe-girdling in luxurious ease. Sea Call's career was meteoric; that is, while afloat. Three months' time about sums it up, yet it required more than a year to build the new epoch-making yacht. The job of scrapping her was accomplished quickly enough to make one's head swim.

William Gardner & Co., designed Sea Call so that she might be constructed during the first year of the cup defense sloop Vanitie, also owned by Mr. Cochran and built by the George Lawley & Son Corp., of Neponset, Mass. When Vanitie was launched they were preparing to cast Sea Call's lead keel—in three sections, mind you, for the outside ballast weighed nearly 200 tons. The monel metal for plating and chrome vanadium steel for frames, bulkheads, etc., began to reach the yard and that's about the first hint given the public that Mr. Cochran was financing the biggest auxiliary schooner yacht in the world. The monel metal and steel hadn't begun to quarrel then.

Sea Call's dimensions rather staggered yachtsmen and the cost of the vessel ready for commission amazed even millionaires. This yacht was 214 feet over all, 150 feet waterline, 33 feet 9 inches beam, and 18 feet 3 inches draft, with 18,000 square feet of sail and mizzen truck something like 160 feet above the water. The deck was selected in Michigan forests, and china, cutlery and linen were specially ordered abroad

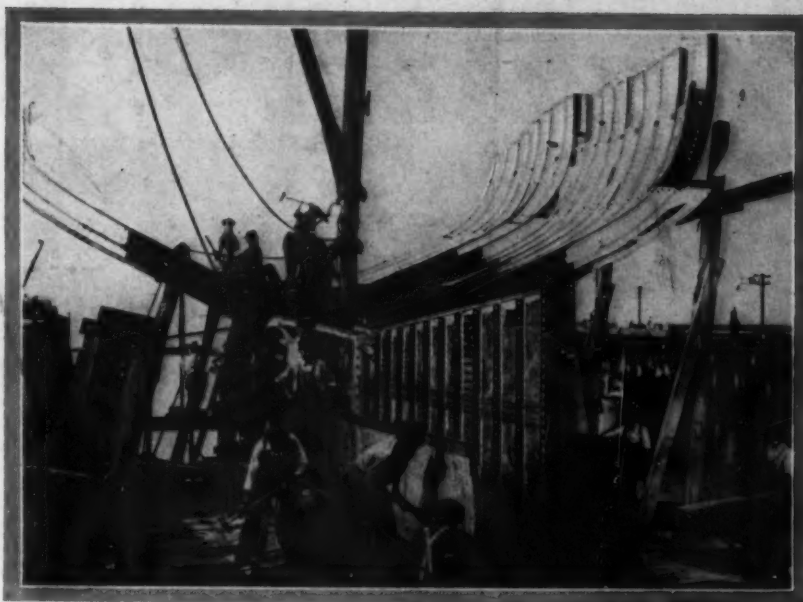
Stern frame of Sea Call showing the propeller arch during the process of dismantling at Lawley's yard at Boston

Sea Call's badly pitted rudder lying on the wharf after being removed from its location

before the keel was cast. An order was placed for a powerful gasoline motor with the Sloane-Daniel Motor Co. of Bound Brook, N. J., which should embody the best creative thought of Paul Daniel, noted French engineer. This motor would not be ready for Sea Call during her first season, so, when the yacht was launched in the spring of 1915 the shaft hole was plugged. She was taken to Long Island Sound under sail and proved handy, fast and seaworthy. Capt. Dick Sherlock, the sailing master, declared her a gem of purest ray serene, for Capt. Dick now and then soars into rhetoric.

After a number of tuning-up spins in New York waters Sea Call was hauled out for cleaning and painting and then it was discovered that chemical action had attacked the structure, the rudder post showing marked signs of disintegration. Experts were summoned and it was decided that the yacht was in bad condition. She was brought back to the Lawley yard for further survey and word leaked out that the monel metal and steel were fighting each other to the detriment of the steel. It was then suggested that Mr. Cochran might discard the plating and apply a new steel skin, thus saving the vessel presumably for many years of usefulness. Next to happen, however, was the construction of blocking at Lawley's where the yacht could be hauled partly out of water, the regular ways not being long enough to accommodate such a bulky craft.

Then, in rapid sequence, came the carpenters who removed the elm deck rails while riggers were stripping the spars and the crew unbent the canvas. Up came the wonderfully handsome deck with its steel houses and foundations for the electric winches. The specially-built steering gear which cost a fortune was carted away and men from the steel shop bearing pneumatic tools and bottles of gases that sever metal like cheese swarmed on stagings, and Sea Call began to melt. Junk dealers from widely different sections were bargaining for the steel and lead, even going to the expense of analyses to make sure about the composition. The frames were removed by chipping off the holding members, the plating being peeled



Taking the hull apart for the junk dealers. This view gives one an idea of Sea Call's size and shows her frames, fin and center-board box

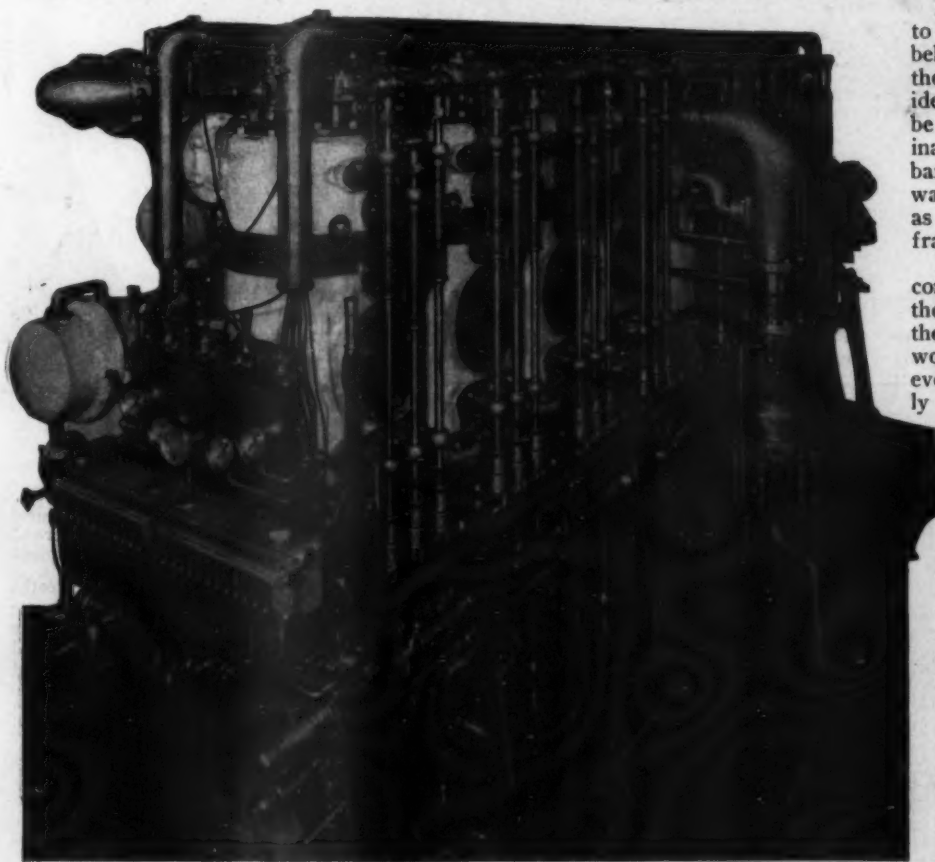
away after knocking off the rivets. The stern frame incorporating the propeller arch, and the stem were treated with a needle of flame that worked almost instantaneously. Yachtsmen who watched the destruction of the fine auxiliary marvelled at the celerity with which the vessel was broken apart when so much skill and painstaking toil were necessary to put her together.

Some of Sea Call's gear has been stored against use in another yacht, but whether the material will be employed in a new vessel approximating the junked beauty is not stated. That Mr. Cochran has not wholly dropped the idea of a long foreign cruise after the war is hinted in yachting circles. The big motor which not long ago successfully passed factory tests may, after all, be installed in some vessel of ample dimensions to stow the capacious fuel tanks required for a reasonable cruising radius.

In designing Sea Call it was planned to use monel metal plates for the hull below the water line and steel plates for the construction above the water line, the idea being that the monel metal would be of special value below the water line, inasmuch as it is not liable to foul from barnacles and other sea growths. Steel was used for the rudder frame, as well as propeller frame and other interior frames of the vessel.

Experiments were made before the construction of Sea Call to investigate the possibility of galvanic action, and these tests seemed to show that there would be appreciably no action. However, the actual conditions proved entirely different than those under which the experiments were made. Actually, the amount of monel metal plating exposed to the water was very great compared to the amount of exposed steel, while in the experiments the proportions of each metal were nearly equal. With salt water as an electrolyte, the monel metal proved to have a very positive potential, while the steel was the negative. As a result a very strong galvanic current was generated, and the negative element was shortly used up.

Examinations of sections of the rudder and hull in which the steel and monel metal came together invariably showed, it is claimed, that the monel metal had not been effected in the least, while the steel was badly pitted where it had not been completely eaten away. The whole case is without precedent, and, therefore, one to be solved by future experiments.



The motor which was to be installed in Sea Call but which was not completed before the hull was junked. The motor was built for Mr. Cochran by the Sloane-Daniel Co., of Bound Brook, N. J., and is rated at 400 horsepower at 250 R. P. M. It has a bore of 11 1/4 inches and a stroke of 20 inches



# Building an 18 Foot Runabout

IN almost every boating community there is to be found any number of good, handy fellows who, though they take great interest in the sport, can only do so in a limited sort of way through not having boats of their own, and it is for just such chaps that this article is really intended. Any one who is at all familiar with the use of ordinary tools can commence the building of this fine little runabout feeling sure he will succeed, for the construction is so simple that almost any amateur can complete the work with good results. When finished, the boat is a most excellent little craft for general purposes, of attractive appearance and possessing marked all around abilities. With a medium priced two-cylinder light-weight motor of from 8 to 12 h.p. turning up in the neighborhood of 900 r.p.m., the boat is capable of making from 12 to 15 honest miles.

Before the actual construction can be started it is quite necessary that the stem, six frames and transom should be first drawn out full size on heavy manila paper. When all these parts have been thus reproduced (full size) from the dimensions as given in the line drawing they should be cut out exact, to be used later as templates when getting out these various parts. Next make a copy of the "List of Material" and send it out to the various local lumber dealers who handle boat material, asking prices for the entire lot. If the local dealer is unable to furnish the stem piece as a natural crook oak or hackmatack knee, send a paper template and inquiry to any one of the lumber firms advertising these

as specialties in MOTOR BOATING and your wants will be attended to in a

bv

C. & Bradley

Part One



planing mill, busy yourself in making a rigid and perfectly level bed or low platform of, say, 2 x 4-inch straight spruce, on which the boat can be erected and stayed true and plumb without risk of twisting out of shape. With the arrival of the lumber you can get out

and bolt together the parts that go to make up each frame mould in accordance with the dimensions given in the constructional detail sketch and the paper templates already cut out. Finish up each frame complete and number it before commencing the next. In sawing out the flared portions of the first four frames a 12-inch coarse, flexible hack saw blade set sidewise in the saw frame helps

Natural crook stem piece

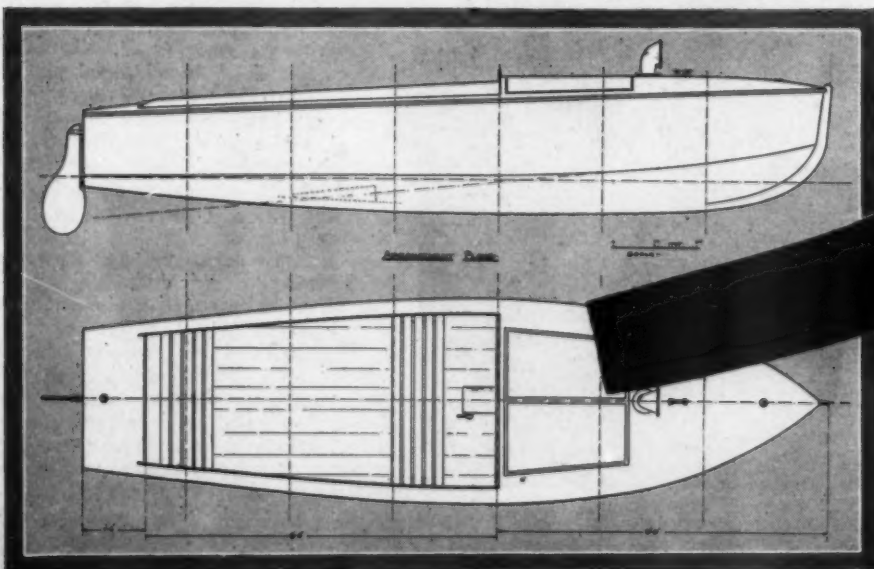
out greatly. Next in order is the transom, and

if possible this should be made in one wide piece of oak, well cleated as shown in the

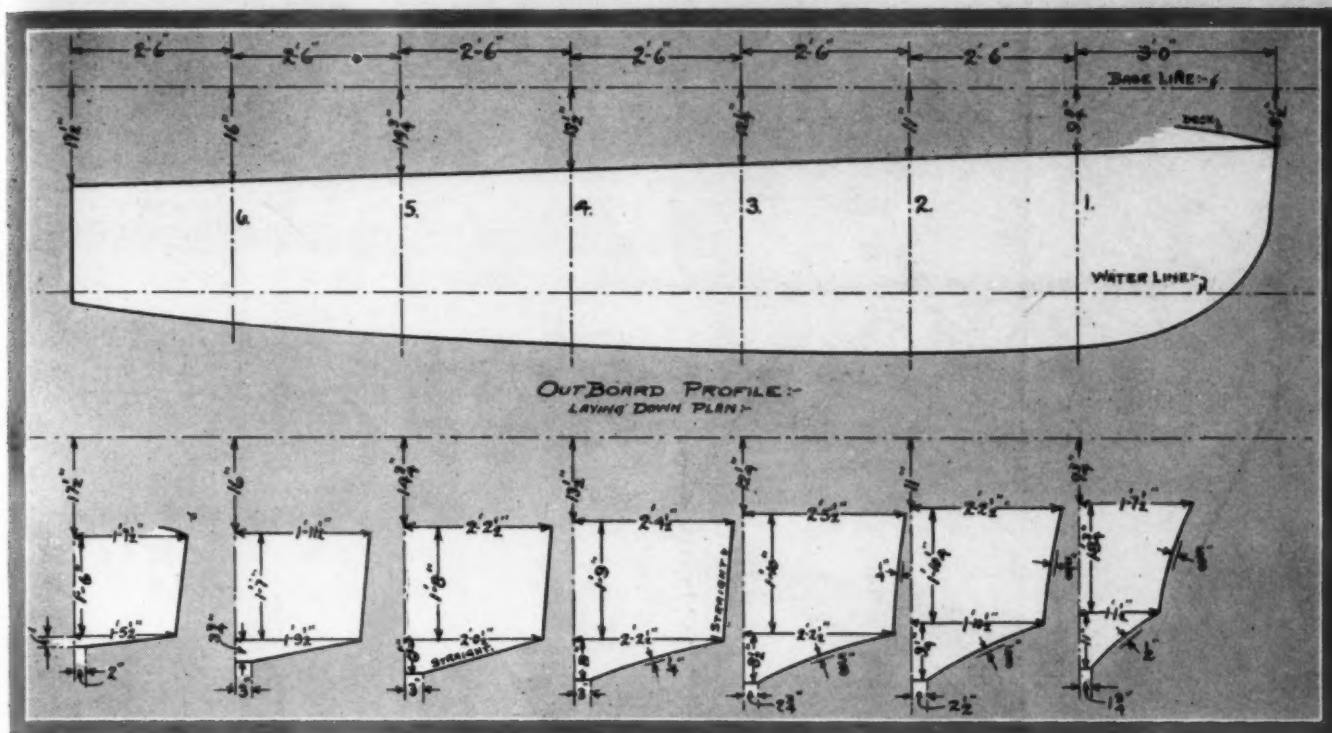
detail drawing. If, however, you are unable to secure the oak wide enough and are forced to make it of two pieces, have the joint come well up above the waterline. The most practical method of making the joint is to plane to an exact true

proper manner. While waiting for replies to your inquiries take advantage of the time for studying the design and planning out the work.

After placing your order for the lumber, etc., and while awaiting its arrival from the







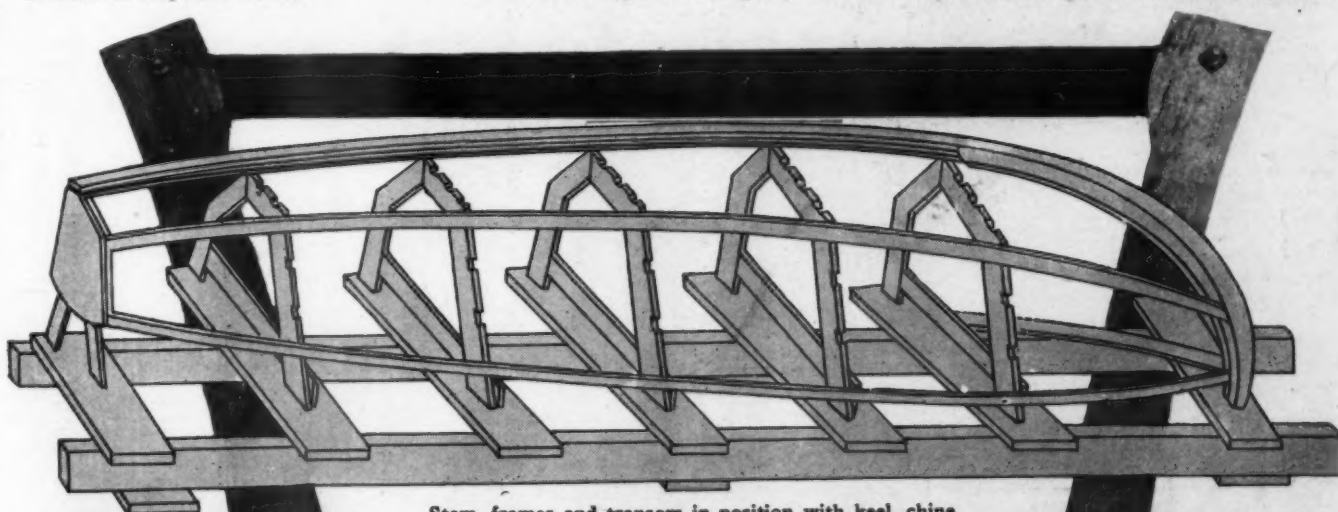
the two edges that are to come together and then bore holes for dowels. Care should be taken to see that these holes are bored square with the seam, equidistant in each board and parallel to each other. The dowels can be whittled out from soft pine, sandpapered, dipped in marine glue and driven into one of the boards. The joint edges of the two boards should also be smeared with the marine glue and the two boards faced together over the projecting glue-covered dowels and the glue allowed to set, after which the transom can be sawed to shape and cleated.

one another when they are bolted together.

The keelson should now be prepared from a straight parallel oak piece 4 inches wide and 7 inches thick. First with a marking gauge draw a center line throughout the entire length on both 4-inch faces, then square up one end and saw off to a length of about 15 feet 3 inches. Taper off for the forward portion from 4 inches wide at a point representing station No. 3, down to about 2½ inches at the very front end or to suit the notched width of your stem piece. The keel is next and should also be a piece of straight, parallel oak

shaped out later, the frame members are now complete, and the actual assembling can be commenced.

Here begins the pleasantest part of the work and if a little care is exercised, the boat should readily take its form. To begin with, first stay each frame mould to prevent spreading. This can be done with a straight piece of stock screwed or bolted across the top. The lower edge of the strip should come somewhere about the indicated sheer line position on each frame. Without doubt the handiest way to erect is upside down on the level and



Stem, frames and transom in position with keel, chine and sheer stringer ready for battens and planking

about 2¾ inches wide by 1½ inches deep, sawed to a length of 16 feet and centerlined similar to the keelson.

The seam battens require no attention, as these are simply clear, straight-grained spruce (preferably) or yellow pine in single lengths planed down to 1¾ by ¾ inches at the mill. With the exception of the transom knee which will be

By this time you should have received your natural crook knee for the stem piece, and this part should be shaped as indicated by the stem

drawing. The rabbet line can be chiseled out approximately for the time being, leaving on stock enough to finish up nicely to the correct depth and plank angle after setting up. The notch that receives the keel should be cut quite accurately, not only to secure close fits of these parts, but to insure their standing plumb with

rigid platform already constructed.

Using the level top surface of the building platform as the base line, adjust and set the frames and transom at their respective stations, each frame with its center falling on a perfectly straight line drawn lengthwise in the middle of the platform. Now finally check up your center distances between the frames, and sheer heights from the base line, and if all are in accordance with the dimensions on the line drawn, cleat and nail the

(Continued on page 63)

One of the frames

*The Auxiliary*

*The Answer to the Windjammers*

**T**HE wind bloweth where it listeth, but its vagaries make less difference to the auxiliary schooner than they did to the windjammer.

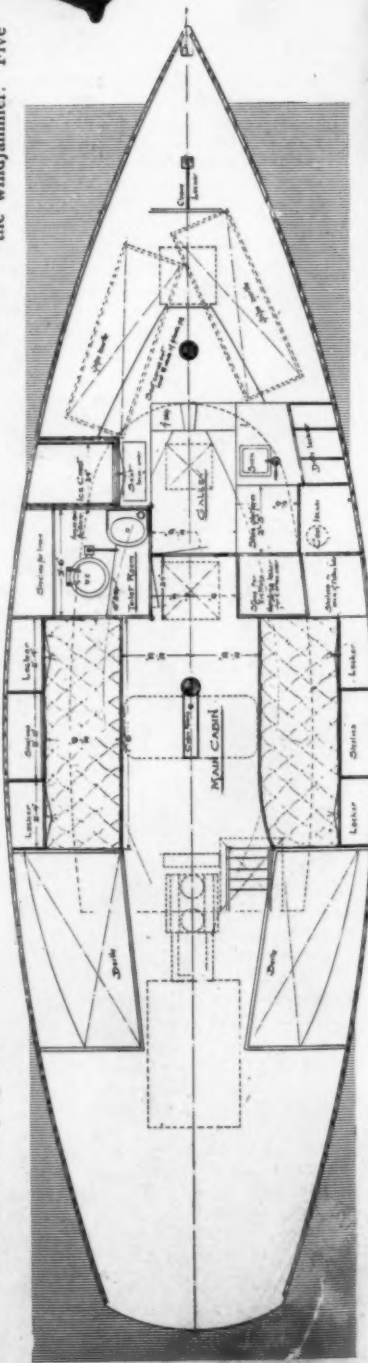
were constructed as sailboats without power, while 12.4 per cent. of the total were auxiliary schoon-

*Photographs by Pearce*

# The Auxiliary

were constructed as sailing boats without power, while 124 per cent. of the total were auxiliary schooners, ketches, yawls, cats and what not. The remaining 80 per cent. were motor boats (minus 1 per cent. steamers), but the preponderance of the motor type of vessel in a year's construction should not be allowed to overshadow the victory of the auxiliary over the windjammer. Five

difficult, dangerous channel to a quiet mooring within. Or, most potent inducer of all, he may break up on a lee shore for lack of that little additional power which would have enabled him to beat off in the face of a howling storm. In the latter unfortunate circumstance even the most contrary sailboat would be almost sure to install power in his next vessel.

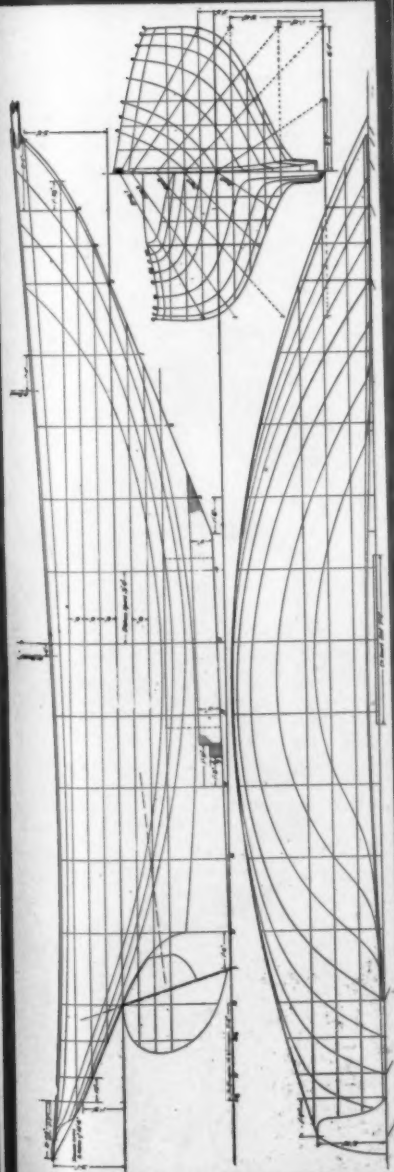


Phydoro's arrangement plan, showing the roomy accommodations which may be obtained in an auxiliary having a waterline length of only 30 feet

**Phydoro,  
a 41-foot  
auxiliary  
schooner**

powered  
with  
a Keystone  
motor





Lines of Phydoro. Note especially the shape of the water planes, buttocks and section and see how the designers have retained the characteristics of a sailing craft, yet modified the lines to meet the requirements of a motor-driven boat

Your hardened old windjammer—the man, not the boat—professes a fine scorn of motor craft, thinks of unkind names for them, of which “the whistle fleet” is one of the least objectionable, and enjoys himself to the full when, by the laws of navigation, they are obliged to keep out of his unruffled way. Nevertheless, there comes a time when he is obliged to temper his thoughts with wisdom, and during that illuminating period he reaches the decision to install a motor in his own cherished windjammer—the boat, not the man.

Any one of a variety of happenings may bring about this decision: There may be a club cruise on which he is the only member without motor power, and it may happen that during the course of this cruise the wind dies away to nothing and leaves him slatting around with useless sails long after the motor cruisers and the auxiliary schooners and yawls have made a snug harbor for the night. Here is a propitious moment for contemplation of the advantages of a marine motor.

Or he may be obliged to anchor in the open because in a fitful breeze and deepening twilight he is unwilling to run a

That this conversion from sail to power is not a figment of the imagination, but an actuality, may be proved by mathematical conclusions. Of the pleasure boats built and put into commission last year and entered in Lloyd's, only 7.6 per cent.



The galley is large and well equipped and full headroom is obtained here as well as in the main cabin

The motor is installed in the main saloon, where sleeping accommodations for four are also provided

years ago, according to Lloyd's, 16 per cent. of the boats built for that year were sailboats and only 10 per cent. of the total number were auxiliaries. Thus, in half a decade the tables have been more than reversed and the sailboat ranks down at the end of the list in point of numbers, with only the steamboat below it.

Nearly all the advantages which pertain to the motor cruiser apply also to the auxiliary, so these need not be repeated at the present time, but the aux-

iliary also possesses features which cannot easily be incorporated in a motor boat. One of these is unusual roominess above decks and below. Where the motor is the main power plant, it follows that a comparatively large amount of power must be installed and ample space set aside for its accommodation, but where the engine is used merely for emergency work it may be of small size and installed in a location which would otherwise be of little use. Economy of operation may be cited as another advantage, especially when the owner is not particular about maintaining a schedule, while the beauty of a spread of snowy canvas on the background of a blue sea is justification enough for sail equipment.

The accompanying illustrations show an especially pleasing auxiliary, designed by Bowes & Mower, which was built by John P. Kirk, of Toms River, N. J., for H. L. Hess, Jr., of Philadelphia. Phydoro is a schooner, 43 feet 1 inch overall by a beam of 12 feet 2 inches and 4½ feet draft. She is powered with a two-cylinder four-cycle Keystone motor.



# A Cruiser with a High-Speed Motor

WHEN Florence IV, owned by William H. Sampson, of Chicago, Ill., was successfully put through her trial paces on the last day of October, 1915, an interesting experiment was turned into an actuality which may have a great influence on the design and power installation of fast motor cruisers.

In a boat of Florence's size—56 by 13 by 4 feet—you would naturally expect to find a great big heavy-duty motor if any kind of speed were expected, but thanks to the medium of a reducing gear it was

possible to install a six-cylinder engine and attain without sacrifice room. It is a common knowledge that high-speed motors are compact, less more amenable than heavy-duty motors of the same

a compact high-speed Van Blerck engine the desired speed facing valuable matter of compact that high-speed lighter, more noisy and to control duty at same

plant with low propeller speed, and a 2 to 1 reduction gear running in oil and cooled by water from the engine circulating system has solved the question in the case of Florence IV at least.

Morris M. Whitaker, designer of the boat, which was built at Weckler's yard

The installation of a high-speed Van Blerck motor in this 56-foot cruiser—Florence IV, owned by W. H. Sampson, of Chicago—makes one of the most interesting jobs of the past season. The six-cylinder engine, turning 1,000 r.p.m. and delivering 100 h.p., is coupled to the propeller by a reduction gear which causes the latter to turn at 500 r.p.m. Thus, the efficiency of a high-speed motor and a slow-speed propeller are combined

By the use of a contact, high-speed motor a great economy of machinery space is attained, permitting large living quarters

power, but it is equally a truism that heavy boats can operate with more efficiency with slow-moving than with high-speed propellers.

in Chicago, has pointed out some of the advantages of this type of power plant. First of all

several feet more of fore and aft space as well as additional headroom in the engine compartment. This 100 h.p. Van Blerck, moreover, weighs only twenty-five pounds per horsepower, whereas a heavy-duty job would weigh from seventy-five to one hundred pounds per horsepower.

Thus, if the big motor had been intended it would have been necessary to make the boat of much heavier construction and to lengthen it to give room for the living accommodations—and this additional length would have meant that 100 h.p. would not have given the required speed of 13 miles.

The problem, therefore, was to find a means of combining high relative speed of the power

comes the saving of room: the Van Blerck motor complete with the reduction and reverse gears occupies approximately 100 by 21 by 36 inches, while a heavy-duty motor of equal power would require

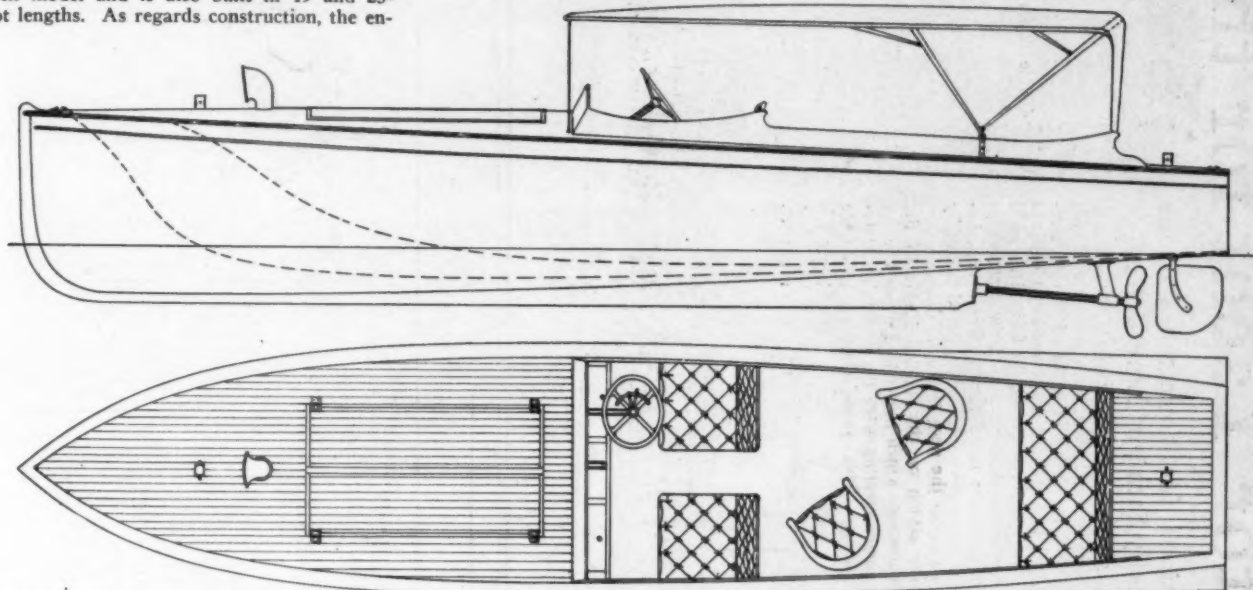
# The 23-Foot Racine Special

A Fast Runabout with Motor Installed Under Hinged Hatches Forward Which Will Be Built for the Spring Trade—To Be Produced Also in 19 and 25-Foot Lengths

ONE of the finest runabouts which has recently been turned out by the Racine Boat Co., Racine, Wis., is shown in the accompanying drawings. This is the 23-foot Racine Special which is offered as a stock model and is also built in 19 and 25-foot lengths. As regards construction, the en-

tire frame is of white oak, and the decks, coaming, motor hood and interior are also of oak; the equipment is very complete, comprising one-man top and curtains, cushions, floor covering, flags, ventilators and motor com-

plete with electric starter and lights. The 23-footer is built to sell, equipped with a 20-30 h.p. motor, at \$1,050; the 19-footer, with a 12-20 h.p. engine at \$800, and the 25-footer with a 25-40 h.p. machine at \$1,400.



Profile and arrangement plan of a new model which is being turned out by the Racine Boat Co. The equipment will be complete and will include electric lighting and starting system, one-man top, seats, cushions, etc.

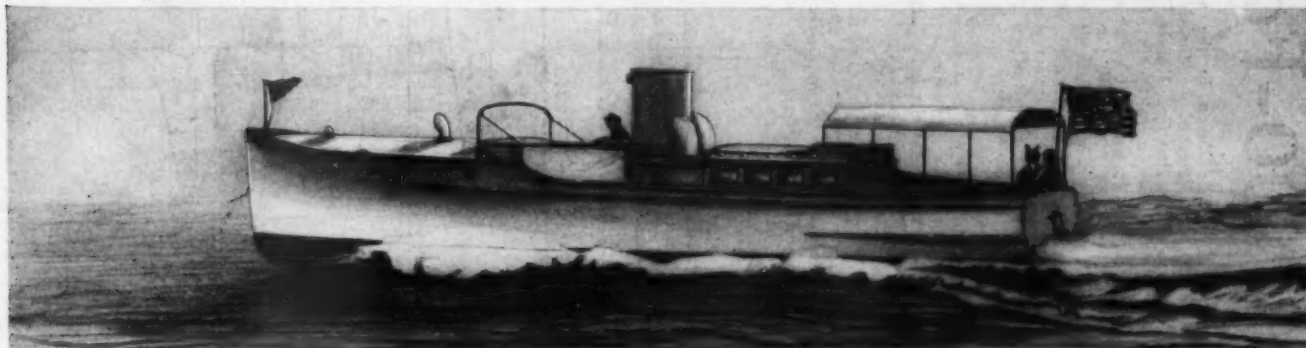
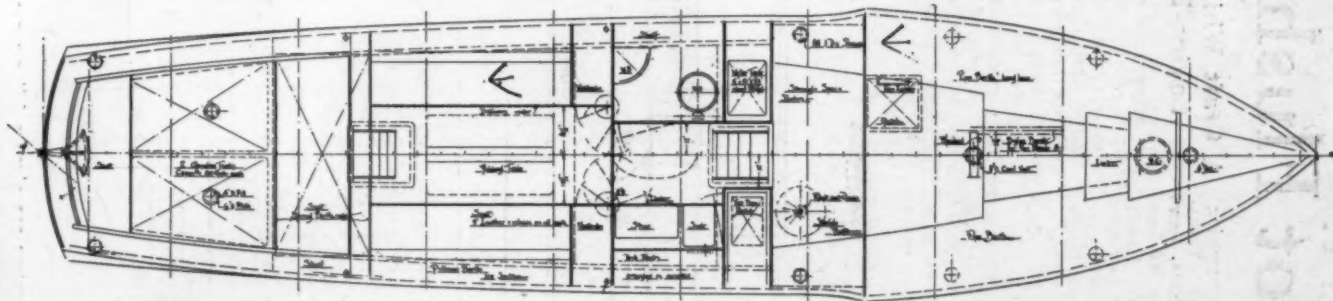
## A Fast Ferry for New York Waters

A 46-Footer with 9-foot 2-inch Beam with a Motor of About 1,100 Cubic Inches Piston Displacement Which is Expected to Give a Speed of 20 Miles—Good Cruising Accommodations

L. KROMHOLZ, of New York, has just designed a 46-footer for use by a local yachtsman in fast ferry service between his country home and the city. As an occasional week-end cruise is also contemplated sufficiently comfortable sleeping and galley accommodations have been provided. In the

main cabin there are transoms, two Pullman berths  $6\frac{1}{2}$  feet long and a comfortable thwart-ship berth. The galley, with a two-burner alcohol stove and a deck-filling ice chest, is forward of the saloon, and opposite it is the toilet with the necessary fixtures. The forward part of the boat is given over to the

engine, with space left for pipe berths for two, and although the power plant has not been definitely decided upon, it is expected that a six or eight-cylinder engine with approximately 1,100 cubic inches piston displacement, giving a speed of over 20 miles per hour, will be installed.



Arrangement plan and wash drawing of a fast and roomy cruiser which is to be built for service between New York City and the owner's country home, covering a distance of 20 miles twice a day



# A 100-Foot Flush-Deck Motor Yacht for the South

**T**HE 100-footer shown in the accompanying plans, was designed by the N. Y. Yacht, Launch & Engine Co., Morris Heights, New York, following the general layout of the 100-foot Van Alst Indian, built by them not long ago for Joseph Van Alst, of New York, with the exception that the boat shown herewith is flush deck. Her principal dimensions are: length over-all, 100 feet; length on the waterline, 93 feet 6 inches; beam, 16 feet 6 inches. She is equipped with two 100 h.p. six-cylinder 20th Century motors, which give her a good cruising speed.

The crew's quarters are located forward and the accommodations in the forecabin are for four men. The upper and lower pipe berths being placed on each side. Locker space is forward of the berths on either side of the door leading into the toilet. The captain's and engineer's rooms are just aft of the crew's mess hall and divided by a passageway which leads into the engine-room. By

this arrangement the boat is given over to quarters, giving them a obtained when the en-amidships. Immediately are two large gasoline fire by steel bulkheads

The owner's quarters and larger part of the design is exceedingly The saloon extends the

entire after part of the owner's and guests' privacy which is not engine-room is placed aft of the engine-room tanks protected from fore and aft.

take up the after  
boat, and the  
well arranged.  
full width of

## A Craft Which Has Sleeping Accommodations for Fourteen Persons Engine-Room Forward, Giving Practically Straight Line Drive

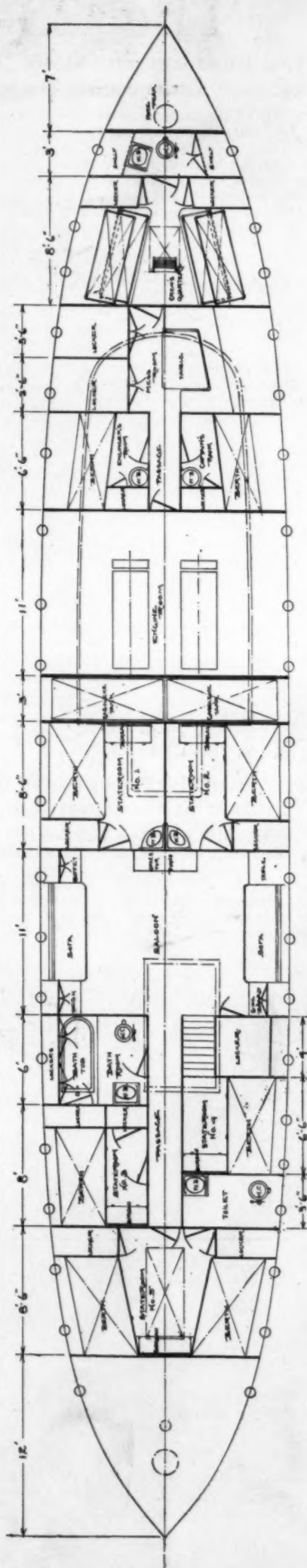
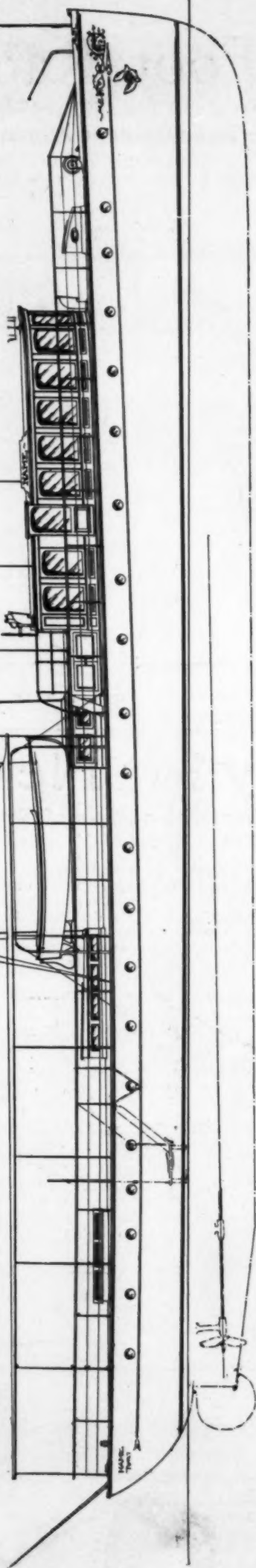
the boat and makes a very comfortable living room. At either side are sofa berths, space also being found on the port side for desk and buffet while the corresponding space to starboard is occupied by sideboard and table. An upright piano will be located forward between two doors leading into twin staterooms. These staterooms are fitted with double berths, bunks, lockers and wash basins, and are well lighted by ports as well as by the deck house window.

Aft of the saloon on the starboard side of the boat is a stateroom which opens into a passageway communicating with the remaining staterooms. This room contains a double

The position opposite it is taken up by a bathroom and another guest's room, with lockers between opening off each of these rooms. The bathroom is completely equipped with porcelain bath tub having hot and cold water piping, wash basin and four-inch pump closet.

The balance of the boat aft is laid out with a large double stateroom for the owner. This room, which is the largest in the owner's quarters, with the exception of the saloon, contains two double berths with individual lockers adjacent, and is directly connected to a private washroom and toilet. A bureau placed aft completes the equipment of this stateroom, which is lighted and ventilated by a skylight as well as the customary ports.

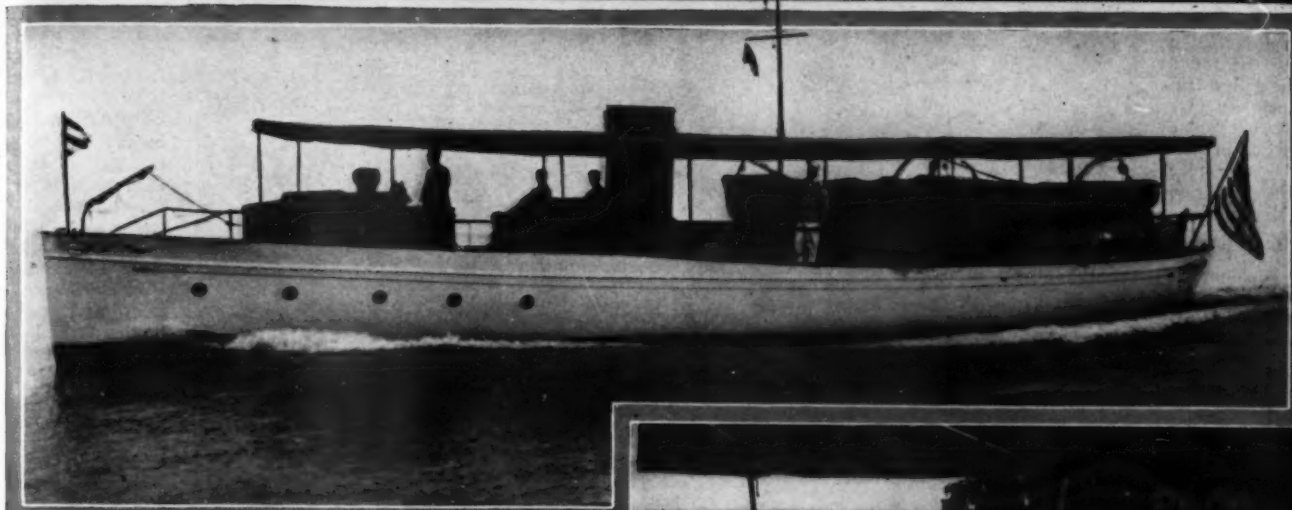
Above decks the arrangement is also attractive. The after deck is ample in size, and there is generous deck room throughout. The bridge deck is raised slightly to give the helmsman a clear view over the forward deckhouse.



In this recent boat the owner's quarters are given a full measure of privacy by placing the engine-room and crew's quarters forward and separated by double bulkheads

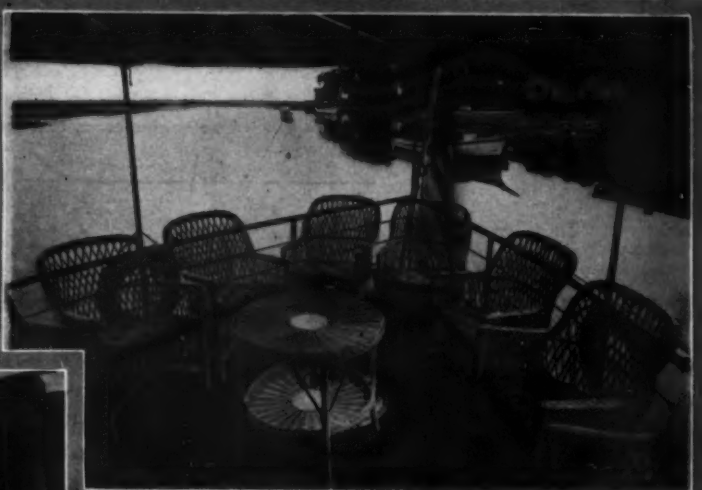


# - FRANCES II -



**T**HE New York Yacht, Launch & Engine Co., of Morris Heights, N. Y. City, has recently completed a 65-foot cruiser for E. M. Jennings, of Bridgeport, Conn., which embodies several new features in its design.

The ample beam of 14 feet enables the interior to be laid out in a manner which will afford the greatest accommodations in a boat of the dimensions of Frances II. Forward, immediately aft of the large fore peak are located the crew's quarters, which contain two berths, and an exceptional amount



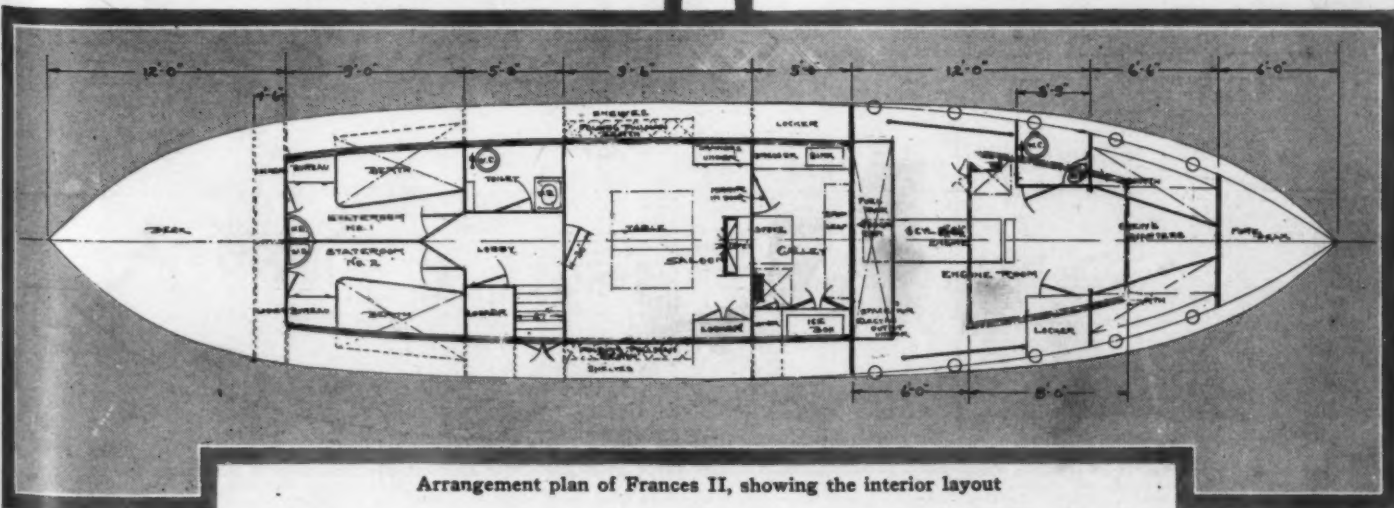
A view of the after deck



In the main saloon amidships

of locker space. The crew's quarters open directly into a large engine-room, in which a six-cylinder,  $6\frac{1}{2} \times 8\frac{1}{2}$ -inch, 20th Century motor, developing 65 h.p., is located. A fuel tank with a capacity of 400 gallons is located directly over the after part of the engine-room, and under the seat at the after end of the bridge deck.

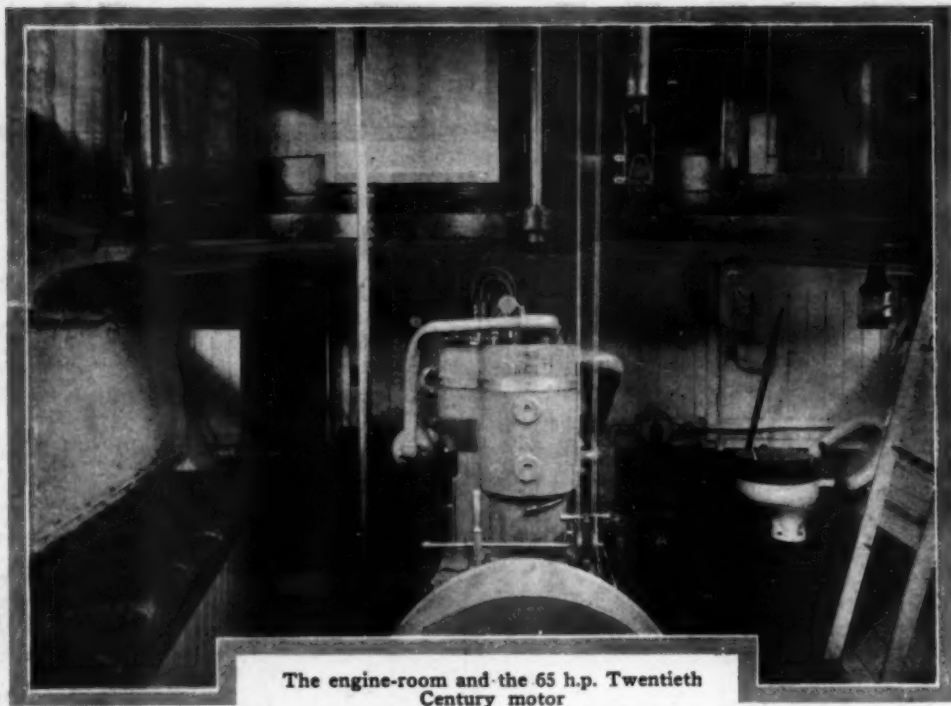
The helmsman's position is at the forward part of the bridge and directly over the motor, and he has direct control of the power plant at all times. A bulkhead extending completely across the boat is located at the after end of the engine-room, and divides this room from the galley which extends the full width of the boat. The galley is completely fitted with the necessary equipment, and contains, among other things, a Shipmate range, with hot-water



Arrangement plan of Frances II, showing the interior layout

boiler. A built-in icebox, lined with cork and mineral wool, together with the usual sink and locker spaces, and a dresser of special design are to be found in the galley. Inasmuch as the trunk over the after cabin extends over the entire fore and aft length of the galley, more than the ordinary amount of headroom and ventilation is afforded.

The main saloon is aft of the galley, and located at the widest part of the boat. A folding Pullman berth on each side of the saloon with a large buffet for-



The engine-room and the 65 h.p. Twentieth Century motor

ward, and an ample sized table, around which it is possible to seat a large party, makes this saloon very attractive.

The entrance from the deck to below decks is by means of a companionway on the starboard side aft, leading to a large lobby between the saloon and two staterooms aft. Each of these staterooms contains a large berth and bureau, and each one is fitted with running water.

The hull is strongly constructed, it having a heavy oak keel with oak framing and pine planking.

## A 55-Footer for Texas

A Remarkable Design for a Real Cruiser to be Used in the Shoal Water Found in the Gulf of Mexico—Powered with a 50 H.P. Motor to Give a Speed of 9 Knots

MORRIS M. WHITAKER, of Nyack, N. Y., has just completed a design for an enthusiastic Texas motor boatman for a 55x13-foot cruiser which is to be used in waters along the Texas coast. One of the particular features about this design is its small amount of draft, as the boat is to be used in very shallow waters and in localities where there are shifting sand bars which are uncharted.

The arrangement which the designer and owner have chosen for this boat appears to work out better than most interior arrangements found in the average cruiser of this

size, the good features of Mr. Whitaker's recent design are embodied in this one. The motor bridge and room forward show a striking similarity to the design of Marilene II, Commodore Williams' 45-footer which made such a hit in eastern waters last summer.

The design shows the usual Whitaker

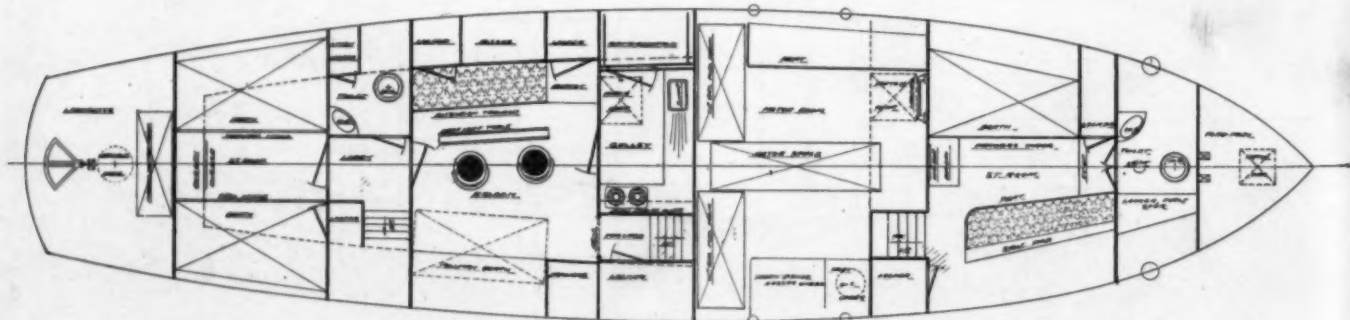
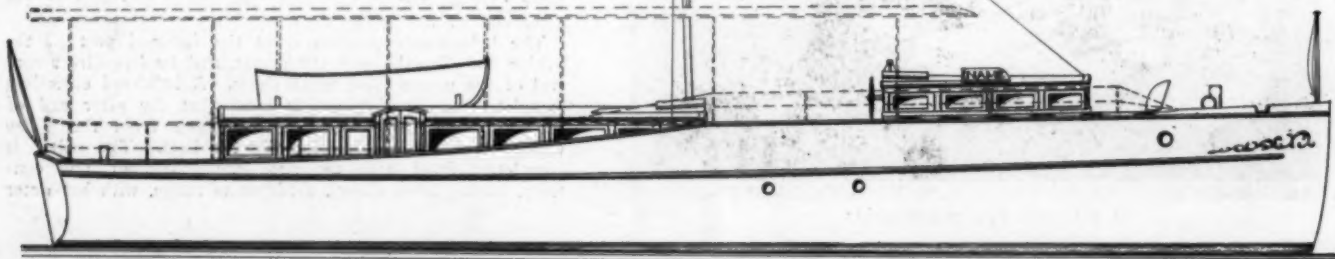
res of two of Mr. signs having been

The after quarter to Monito and owner's state-very strik-

characteristics of flaring, and the V midship section continued out into the transom.

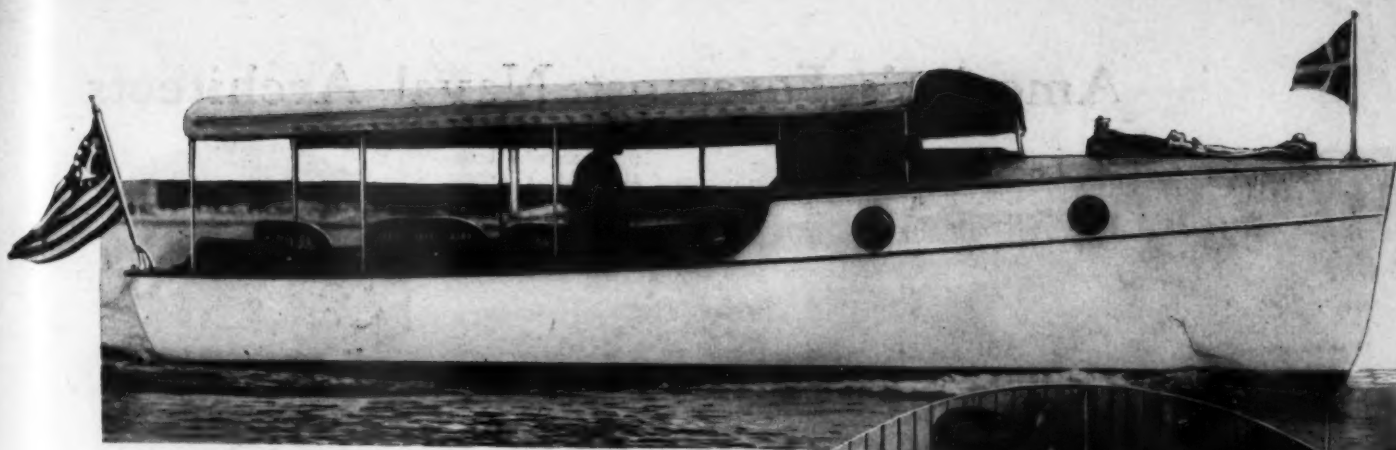
A speed of 9 miles an hour is all that is called for in the design, although the 50 h.p. Buffalo which is to be installed in the motor room forward will give the new craft a cruising speed of at least 9 knots. More emphasis has been placed on comfortable cruising accommodations with plenty of light and ventilation, than on speed.

The hull will be constructed of cypress and the exterior of the deck-house will be in teak.



Design of a 55-foot shoal-draft cruiser, which shows more than the usual amount of accommodations





This 31-footer is owned by Miss Julia Parker of Detroit, who uses it at her summer home in Jamestown, R. I.

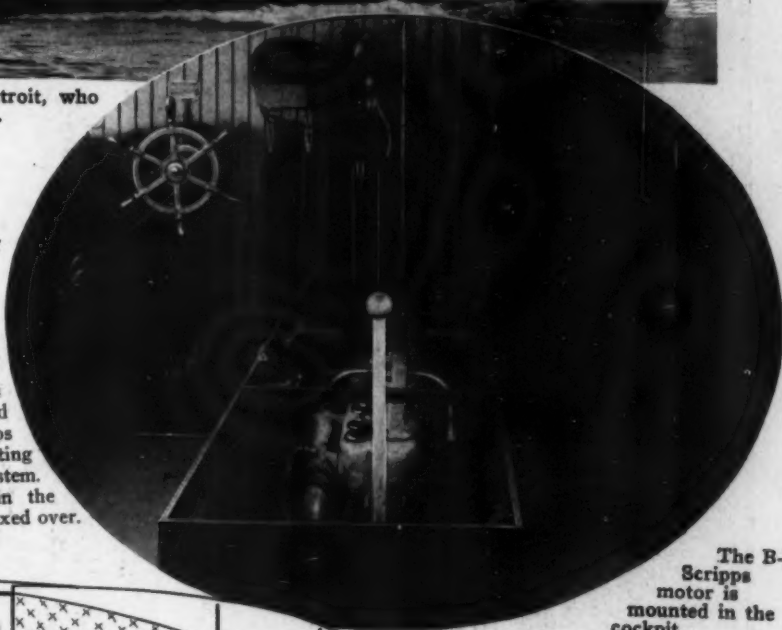
## Juliette

A 31-Foot Day Cruiser Marked by Exceptional Length of Cockpit

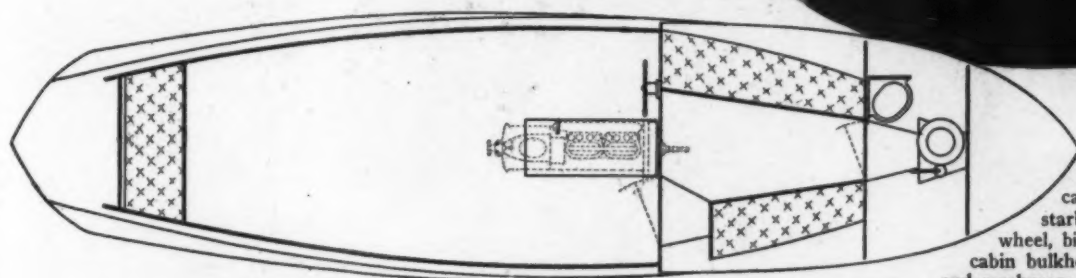
**A** HANDSOME day cruiser with high freeboard forward and an exceptionally large cockpit, is Juliette, owned by Miss Julia Parker, of Detroit, and used by her at her summer home at Jamestown, R. I. Jamestown is located on Conanicut Island, and in the picture Juliette is seen flying the pennant of the Conanicut Yacht Club.

This boat was designed by Carlton Wilby, of Detroit, and was built by the Church Boat Co., at Sibley, Mich. She is 31 feet long by a

beam of 7 feet, and her power plant is a four-cylinder Series B Scripps motor equipped with a Scripps single-unit starting and lighting system. The motor is in the cockpit and is boxed over.



The B-4 Scripps motor is mounted in the cockpit



In the cockpit there is a fixed seat aft and there is room also for four or five wicker deck chairs. The cabin forward is entered on the starboard side, and the steering wheel, binacle, etc., are mounted on the cabin bulkhead to port. There is a toilet and washroom forward of the cabin.



### For a Volunteer Naval Reserve

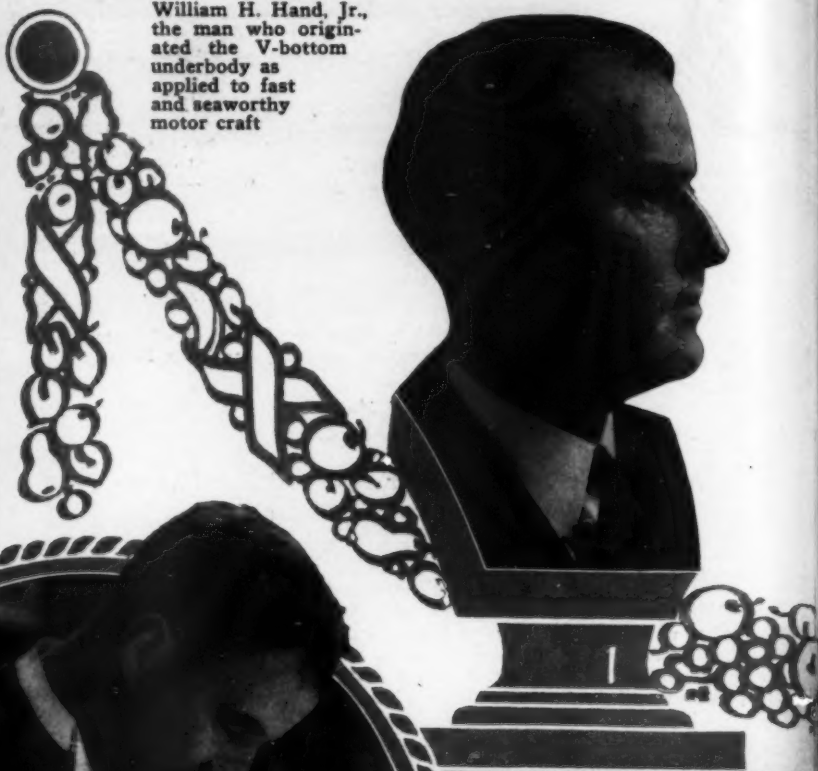
Since the building last summer of the fast cruiser Houe-Lu, five boats of similar design have been constructed. They are 40 feet in length by 8 feet 6 inches beam, and, powered each with a 125 h.p. Sterling motor, they are expected to give a speed of 23 to 24 m.p.h. Acting on the suggestion of Mr. Swasey, of Swasey, Raymond & Page, the designers, the owners of these boats have organized a Volunteer Patrol Squadron which is expected to demonstrate the efficacy, as well as the need, of such a fleet in patrolling our coasts. The boats are so designed that it will be possible, if desired, to install more power and shoot the speed up to 30 m.p.h. It is expected that these boats will cruise in squadron formation for three or four weeks each summer.

# America's Foremost Naval Architects

William H. Hand, Jr., the man who originated the V-bottom underbody as applied to fast and seaworthy motor craft



J. Murray Watts, the Philadelphia naval architect



Above  
Frederic S. Nock, of East Greenwich, R. I., designer and writer of many articles on "How to Build Motor Boats"



Carlton Wilby, of Detroit, a very successful designer of fast yachts



William J. Deed, Jr., of Boston, who has designed a number of successful motor boats



Frederick K. Lord



# Who Specialize in Motor Boat Designs



John H. Wells, who has designed most of the motor yachts built by the Matthews Boat Co. Altogether some 1,400 motor boats have been built from his plans



Thomas D. Bowes, of the firm of Bowes & Mower, of Philadelphia, who is a strong advocate of the round bilge boat for speed

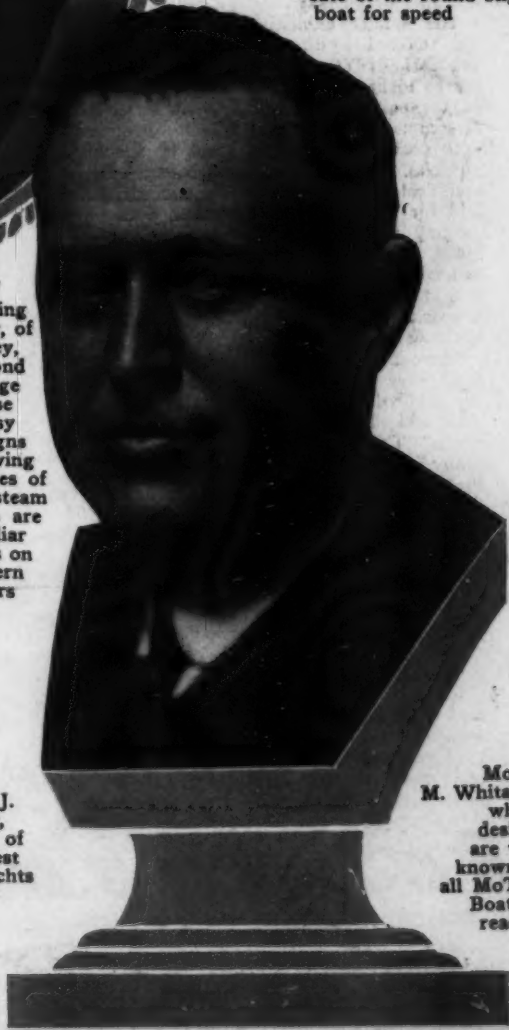


Above

A. Loring Swasey, of Swasey, Raymond & Page whose classy designs following the lines of large steam yachts are familiar sights on Eastern waters



Henry J. Gielow, designer of the largest motor yachts afloat



Morris M. Whitaker, whose designs are well known to all MoToR BoatinG readers



# 1916 MOTOR BOAT SHOW

## The Value of Motor Boat Shows

What the Annual Exhibitions of Boats, Motors and Accessories Means to Motor Boatmen—  
How the Industry as Well as the User Profits by the Shows

By Ira Hand

*Secretary National Association of Engine and Boat Manufacturers*

**I**N considering the various phases of the value of these shows to the boat and engine builders, we might first point to the unbroken succession of these exhibitions in New York City, aside from Motor Boat Shows that have been held in Chicago, Boston and other cities.

These National Shows provide an opportunity for the builders to place their new ideas, their latest styles as it were, before the buying public. Coupled with this we have the cumulative effect of the general advertising of the builder's product on a more extended scale than at any other time during the year. General interest is thus awakened all over the country by the concerted action of the prominent builders and manufacturers in the creation of this immense exhibition and its attendant lines of publicity.

The builder exhibiting at these shows is also offered a direct comparison with the products of other manufacturers, and this serves to keep the various exhibitors abreast of the public demands. Opportunity is also offered the manufacturer to come in contact with conditions as encountered by the local agencies. From all parts of the country agents and dealers attend the show, and plans are laid for an extension of business during the ensuing year. New agency connections are made, and dealers are acquainted with changes in business, new selling programs are mapped out, and the exchange of ideas is bound to be beneficial to the builder and his field representatives.

There are many commodities that are, by their very use, brought prominently before the public day in and day out all through the year, and these might be termed "self-advertisers." The motor boat has but limited opportunity in this direction and, aside from this, the selling territory must necessarily be confined to the coast lines of the country and its tributary waterways. Therefore, to see is to have created the desire to own, and the motor boat has but this one week out of each year to gather with its kind, "high and dry" on land, in an endeavor to beguile the dollars out of the pockets of the buying public.

It is in this opportunity to create sales or prospective customers, and to feel the public pulse in its various manifestations of interest, that the Motor Boat Show differs from other industrial exhibitions. At nearly every exhibit you will find in personal attendance the individual manufacturers and the heads of their various departments from the factory

or plant, the care of the exhibit not being entirely entrusted to agents or minor representatives. This time-honored custom of personal supervision must needs be of value to the buying public. Then, too, in many cases the boat and its entire equipment may not be sold as a unit and the show affords an opportunity for the manufacturers to assume business relations.



Secretary Ira Hand

Aside from the direct sales made at the show and the listing of many new prospective customers for the future attention of the sales department, appointments are made for actual demonstrations and a wider field is opened up for circularization purposes.

The energetic and successful manufacturer who, after arranging for and paying the cost of his space, determines to get the very best possible results out of his investment of time and money, enjoys his privileges at these shows

to the utmost. He has for months anticipated this chance to prove to the visiting public the superiority of his product and he is "on the job," early and late, to corral the business that is apt to come at the most unlooked-for moment.

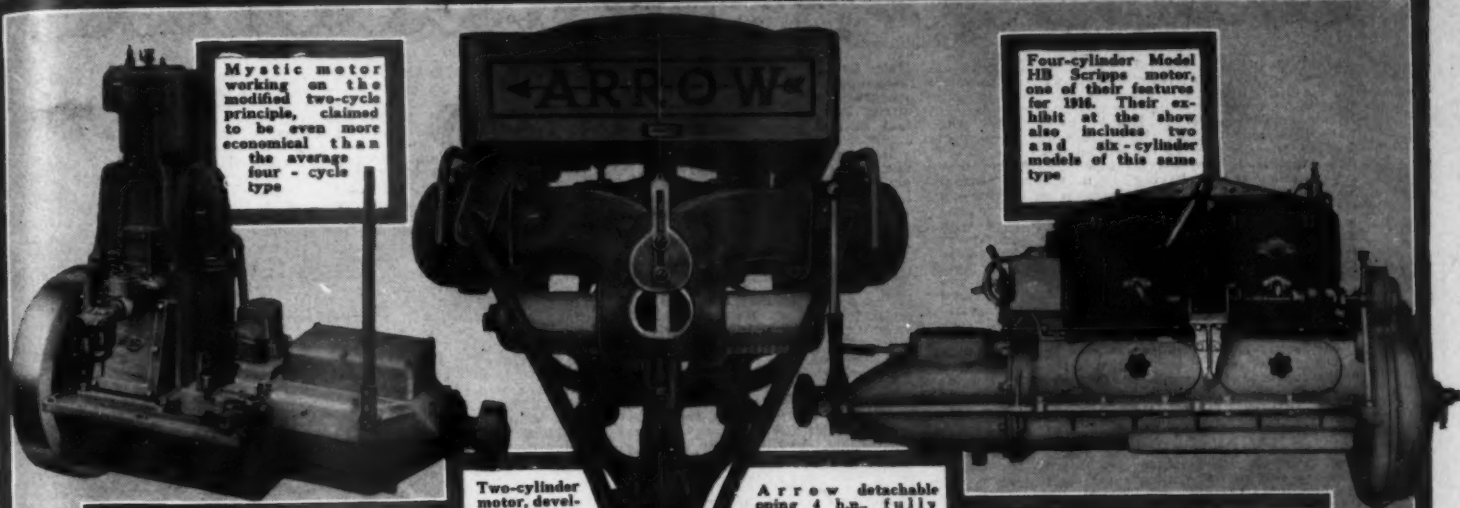
In taking up the question of the value of the show to the buyer, we are again confronted with the opportunity for direct comparison. This perhaps means more to the experienced yachtsman than to one who has never owned a boat. The newest models are spread before him in a delightful profusion. The man who already owns or has owned a boat will tell you that his intention to keep up-to-date in his equipment is not so much a matter of personal pride as it is his desire to take advantage of any advance in design or mechanism that will make for greater efficiency, performance or comfort. Scores of thousands who have never owned a boat will, however, attend the show to gaze upon, and admire, the various craft, and to look forward longingly to the time when they, too, will be the proud possessors of a cruiser or runabout—"just like the one we saw at the show."

The time of the year at which the show is held is also of benefit to the buying public. Stock models are ready for delivery, and boats built on specification may be finished and delivered for use during the coming season. There is also plenty of time for the installation of new equipment. The show comes at a time equidistant from the close of the previous season to the opening of a new one—thereby doing much to sustain interest and revivify the spirits of the motor boat enthusiast who can hardly bide the time until he can again get out on the water. The show is of value also to the women and children, and carries an especial appeal to them. An authority on advertising recently canvassed the inquiries and resultant sales of an automobile concern, and found that 92 per cent. of the sales had been made either directly to women or had been influenced by one of the fair sex who, even if not exactly purchasing the car direct, had swayed the judgment of the buyer.

If that condition exists in the automobile business, and we do not presume to question the statement in the least, then surely an even greater percentage of the boat sales that are made may be traced to the women and children, who know that the possession of a motor boat will afford them, as well as the men folks, just the sort of healthful recreation that they crave.







Mystic motor working on the modified two-cycle principle, claimed to be even more economical than the average four-cycle type

Four-cylinder Model H.B. Scripps motor, one of their features for 1916. Their exhibit at the show also includes two and six-cylinder models of this same type

Two-cylinder motor, developed

Arrow detachable opening 4 h.p., fully

## Motor Boat Show Exhibitors

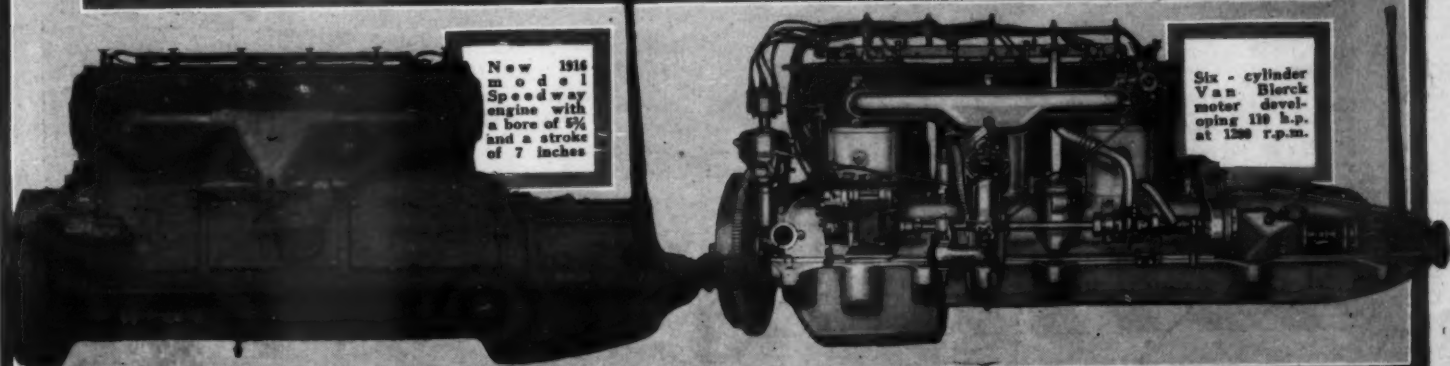
The names below are of those who have going to press with this issue. Some few are always late changes and newcomers. But complete when the show opens January 29th

taken space in the motor boat show up to the time of additional exhibitors will undoubtedly be seen as there even so, the list below will be found to be practically at Grand Central Palace, New York City.

Able Engine Co., Inc., New York City  
 Albany Boat Corp., Albany, N. Y.  
 Apple Electric Co., Newark, N. J.  
 Arrow Motor & Machine Co., N. Y. City  
 Automatic Machine Co. Bridgeport, Conn.  
 Berry Bros., Inc., Detroit, Mich.  
 Billings-Chapin Co., Cleveland, Ohio  
 Bolinders Co., New York City  
 Bosch Magneto Co., N. Y. City  
 Bridgeport Motor Co., Inc., Bridgeport, Conn.  
 Brooklyn Varnish Mfg. Co., Brooklyn, N. Y.  
 Bruns, Kimball & Co., Inc., N. Y. City  
 Buffalo Gasoline Motor Co., Buffalo, N. Y.  
 Byrne Kingston & Co., Kokomo, Ind.  
 Campbell Co., A. S., Boston, Mass.  
 Cape Cod Power Dory Co., Wareham, Mass.  
 Carlyle Johnson Machine Co., Manchester, Conn.  
 Chicago Varnish Co., New York City  
 Columbian Brass Foundry, Freeport, N. Y.  
 Craig Engine & Machine Works, James, Jersey City, N. J.  
 Crockett Co., The David B., Bridgeport, Conn.  
 Debevoise Co., The, Brooklyn, N. Y.  
 Durkee & Co., Chas. D., N. Y. City  
 Edison Storage Battery Co., Orange, N. J.  
 Ehrmann, Herbert B., Boston, Mass.  
 Elco Company, The, Bayonne, N. J.  
 Electric Tachometer Co. The, Philadelphia, Pa.  
 Ericsson Mfg. Co., Buffalo, N. Y.  
 Evans-Skillman, N. Y. City  
 Evinrude Motor Co., Milwaukee, Wis.  
 Fairbanks, Morse & Co., N. Y. City  
 Fay & Bowen Engine Co., Geneva, N. Y.  
 Ferro Machine & Foundry Co., Cleveland, O.  
 Francke Co., The, N. Y. City  
 Friable Motor Co., The, Middletown, Conn.  
 Gas Engine & Power Co., and Chas. L. Seabury & Co., Cons., Morris Heights, N. Y. City  
 Generator Valve Co., Brooklyn, N. Y.  
 Gillespie-Boynton Co., Paterson, N. J.  
 Gillespie & Sons, Chas. H., Jersey City, N. J.

Gray Motor Co., Detroit, Mich.  
 Harris, L. H., N. Y. City  
 Heinze Electric Co. Lowell, Mass.  
 Henricks Magneto & Electric Co., Indianapolis, Ind.  
 Higgins & Seiter, N. Y. City  
 Holospar Cooperage Co., Edgewater, N. J.  
 Johns-Manville Co., H. W., N. Y. City  
 Jones Co., S. M., Toledo, O.  
 Kahnweiler's Sons, David, N. Y. City  
 Knoblock-Heideman Mfg. Co., South Bend, Ind.  
 Kokomo Electric Co., Kokomo, Ind.  
 Koven & Bro. L. O., N. Y. City  
 Lamb Engine Co., Clinton, Iowa.  
 Lawley & Son Corp., Geo., Neponset, Mass.  
 Leece-Neville Co., The, Cleveland, O.  
 Loew-Victor Engine Co., Chicago, Ill.  
 Lord de Luxe, N. Y. City  
 Luders Marine Const. Co., Stamford, Conn.  
 MacRae, Hector Co., Baltimore, Md.  
 McClellan, Chas. P., Fall River, Mass.  
 Marine Oil Engine Co., Inc., New York City  
 Mason Machine Works, Taunton, Mass.  
 Matthews Boat Co., The, Port Clinton, Ohio  
 Mianus Motor Works, Stamford, Conn.  
 Miller, Chas. E., N. Y. City.

Monarch Valve Co., Brooklyn, N. Y.  
 Monitor Boat & Engine Co., Newark, N. J.  
 Morristown Boat & Engine Works, Morristown, N. J.  
 Motor-Compressor Co., Newark, N. J.  
 Murray & Tregurtha Co., South Boston, Mass.  
 Mystic Motor Co., The, Mystic, Conn.  
 New London Ship & Engine Co., Groton, Conn.  
 Niagara Motor Boat Co., North Tonawanda, N. Y.  
 Niagara Motors & Mfg. Co., Inc., Dunkirk, N. Y.  
 North East Electric Co., Rochester, N. Y.  
 Palmer Bros., Cos Cob, Conn.  
 Paragon Gear Works, Taunton, Mass.  
 Peerless Marine Motor Co., Buffalo, N. Y.  
 Platt & Washburn Refining Co., N. Y. City.  
 Pyrene Mfg. Co., N. Y. City.  
 Randolph, Inc., L. W. Newark, N. J.  
 Scripps Motor Co., Detroit, Mich.  
 Smith, Edward & Co., L. I. City, N. Y.  
 Smith-Meeker Engineering Co., N. Y. City.  
 Smith-Serrell Co., Inc., N. Y. City.  
 Snow & Petrelli Mfg. Co., New Haven, Conn.  
 Sperry Gyroscope Co., Brooklyn, N. Y.  
 Splittorf Electrical Co., Newark, N. J.  
 Standard Gas Engine Co., San Francisco, Cal.  
 Stanley & Patterson, Inc., N. Y. City.  
 Sterling Engine Co., Buffalo, N. Y.  
 Sumter Electrical Co., Chicago, Ill.  
 Sutcliffe-Madsen Co., New York City.  
 Talbot Boiler Co., N. Y. City.  
 Tiebout, W. & J., N. Y. City.  
 Toppan Boat Mfg. Co., Boston, Mass.  
 Valentine & Co., N. Y. City.  
 Van Blerck Motor Co., Monroe, Mich.  
 Verrier Eddy Co., N. Y. City.  
 Welin Marine Equipment Co., L. I. City, N. Y.  
 Wheeler & Schebler, Indianapolis, Ind.  
 Willis Co., The E. J., N. Y. City.  
 Winton Engine Works, Cleveland, O.  
 Wisconsin Motor Mfg. Co., Milwaukee, Wis.  
 Wright & Co., E. J., N. Y. City  
 Woolsey Paint & Color Co., C. A., Jersey City, N. J.  
 Zundel, R. W., N. Y. City



New 1916 model speedway engine with a bore of 5 1/2 and a stroke of 7 inches

Six-cylinder Van Blerck motor developing 110 h.p. at 1200 r.p.m.

## The 1916 Motor Boat Show

Chief among the several distinctive features of the exhibit of the **Sterling Engine Co.**, of Buffalo, N. Y., is the new Model F motor that this company has been manufacturing in large quantities for heavy express service. Except to the few who have been able to visit the big Sterling factory in Buffalo, the show offers the first opportunity to see and examine this wonderful new engine, the first construction series having been shipped abroad. Two new Model F motors are on exhibition—an eight and a six. These motors have a bore and stroke of  $5\frac{1}{2}$  x  $6\frac{1}{4}$  inches and are equipped with manganese bronze upper bases and aluminum or iron lower bases as required. The eight develops 130 h.p. at 1,000 r.p.m. and 200 h.p. at 1,500 r.p.m., while the six develops 110 h.p. at 1,000 r.p.m. and 145 h.p. at 1,500 r.p.m. Both these motors are shown with full regular equipment, which includes electric starter and generator. The motor is entirely enclosed—not a gear exposed.

The larger eight-cylinder Model F 300 h.p. motor which was on exhibition at the 1915 show, is seen again in the Sterling space. Two of these motors have formed the power plant of Roy A. Rainey's 30-mile express cruiser *Concho*. The bore and stroke of the F300 is  $6\frac{1}{2}$  x 9 inches and the weight 5,000 pounds.

The Sterling company invites the attention of those who require a lighter motor than the Model F to its 1916 Model B motors for medium-duty and medium-speed service. Three of the Model B's may be seen at the show—the B 20-35, the B 35-55 and the six-cylinder B 50-85. The 1916 models of the B 20-35 motor, as well as the high-speed R 50 h.p. motor are equipped with enclosed valves and enclosed push rods. The B 35-55 and B 50-85 as well as the R 90, 135 and D 50 are equipped with hollow crankshaft force feed lubrication.

The famous racing engine, the Sterling Model R 225-250 h.p., which has driven so many speed boats to fame and victory, may be seen at the show with certain improvements which include a new and specially constructed bronze upper base (construction patent allowed) and enclosed reverse gear. The Sterling Kid and the handsome Model E 17-25, the Kid's big brother, are also on exhibition.

The owner whose boat is engaged in fishing or other commercial service, as well as the yachtsman interested in engines for heavy cruisers, will find the Sterling heavy-duty motors of great interest. The entire line of Model D Sterlings is exhibited, numbering six in all. These range from the two-cylinder 12-15 h.p. machine, to the eight-cylinder 200 h.p. motor. The Sterling exhibit comprises fifteen motors all told.

President Charles A. Criqui, Arthur J. Utz and R. Bradford Burnham, of the Sterling company, are in attendance and will consider it a pleasure to answer all questions within their power. They are assisted by Messrs. Bruns, Kimball and Parr, of Bruns, Kimball & Co., New York distributors of the Sterling company.

As usual, **Palmer Bros.**, of Cos Cob, Conn., are showing a very complete line of engines, there being twenty-two models in all in their space. Palmer motors are made in both two and four-cycle types and in a range of power extending from 2 to 80 h.p. In the two-cycle type there are nine one-cylinder models in 2,  $2\frac{1}{2}$ ,  $3\frac{1}{4}$ , 4,  $5\frac{1}{4}$ , 6 and  $7\frac{1}{4}$  h.p. and five two-cylinder models in 4, 8, 10, 11 and 12 h.p. The three-cylinder engines which in each case are identical with one of the two-cylinder sizes except for the addition of a cylinder are turned out in 8 and 15 h.p. The four-cylinder models offer the widest range in power, it being possible to obtain one of these to fit practically any motor from a small tender up to a large motor yacht.

They are all built for medium or heavy-duty use. Standard ignition equipment on the four-cycle motors is jump spark, but the models NK in two, three, four and six cylinders developing 25, 35, 50 and 80 h.p. respectively, are equipped with both jump spark and make and break. The two motors which form the chief feature of this year's Palmer display are a four-cylinder 8 h.p. Model A and a six-cylinder 50 h.p. Model F & The F & has  $6\frac{1}{2}$  x 8-inch cylinders and is an extension of the F line which is already built in one, two, three and four cylinders.

The **Bridgeport Motor Co., Inc.**, of Bridgeport, Conn., is occupying space D on the main floor of the Palace and the complete line of 1916 Bridgeports is shown. These motors are divided into three general types as follows: Two-cycle heavy-duty models, two-cycle high-power speed models and four-cylinder four-cycle heavy-duty engines. In the two-cycle speed line there are two single-cylinder motors developing 8 and 11 h.p., respectively and two two-cylinder models of the same general design rated at double the power. The cylinder dimensions of these two types are  $4\frac{1}{2}$  x 5 inches and  $5\frac{1}{4}$  x  $5\frac{1}{4}$ , and all motors run at a normal speed of 800 r.p.m. In the two-cycle heavy-duty line there are nine models, five of the single-cylinder type and the remainder in the two-cylinder construction. A power range of from  $2\frac{1}{2}$  to 18 h.p. is offered. These two lines (the heavy-duty and the high-speed) are identical in general design and construction in all features, such differences as there are lying chiefly in port areas, locations and sizes of by-passes, etc. They are all of the well-known Bridgeport non-back-firing type.

The Bridgeport heavy-duty four-cycle motors are turned out in two, three and four-cylinder sizes, developing 24, 36 and 48 h.p., respectively. The bore and stroke in all four-cycle models is the same,  $7\frac{1}{2}$  x 9 inches, and the horsepower is based on a speed of 375 r.p.m. These heavy-duty motors are adaptable to cruisers requiring motors of this style, and commercial boats. They are designed and constructed for hard service.

The upper part of the crankcase is cast in one piece and is securely bolted to the bed plate. The cylinders are cast separately and are bolted to the crankcase. The cylinder heads are also cast separately and are water jacketed, the water being by-passed on the outside from the cylinder jacket. The heads are of the L-type and are fitted with large inspection plates over the valve chambers so that the valves are readily accessible. Each valve lifter is assembled in a bronze dust-proof housing and each unit may be easily removed. The camshaft location is on the exterior of the crankcase, properly supported by journals and completely protected. Yet the cams are open for inspection and by removing the journal caps the shafts can be removed intact.

The **Wisconsin Motor Mfg. Co.**, of Milwaukee, Wis., has on display an interesting exhibit of its famous Wisconsin Consistent motors, of which the types M and P occupy the center of the stage. The type M is a four-cylinder machine with  $5\frac{1}{2}$  x 7-inch bore and stroke developing its rated 64 h.p. at 800 r.p.m. The piston displacement of this motor is 728 cubic inches and the weight complete is 1,140 pounds. It is of the T-head type with cylinders cast in blocks of two, and it is put out as a unit power plant. The equipment includes Bosch duplex magneto, reverse gear, spark plugs and wiring complete and a Rayfield, Stromberg or Schebler carburetor. The type P is a six-cylinder motor having the same bore and stroke and operating at the same r.p.m., but developing 94 h.p. The equipment is identical. Wisconsin motors are constructed

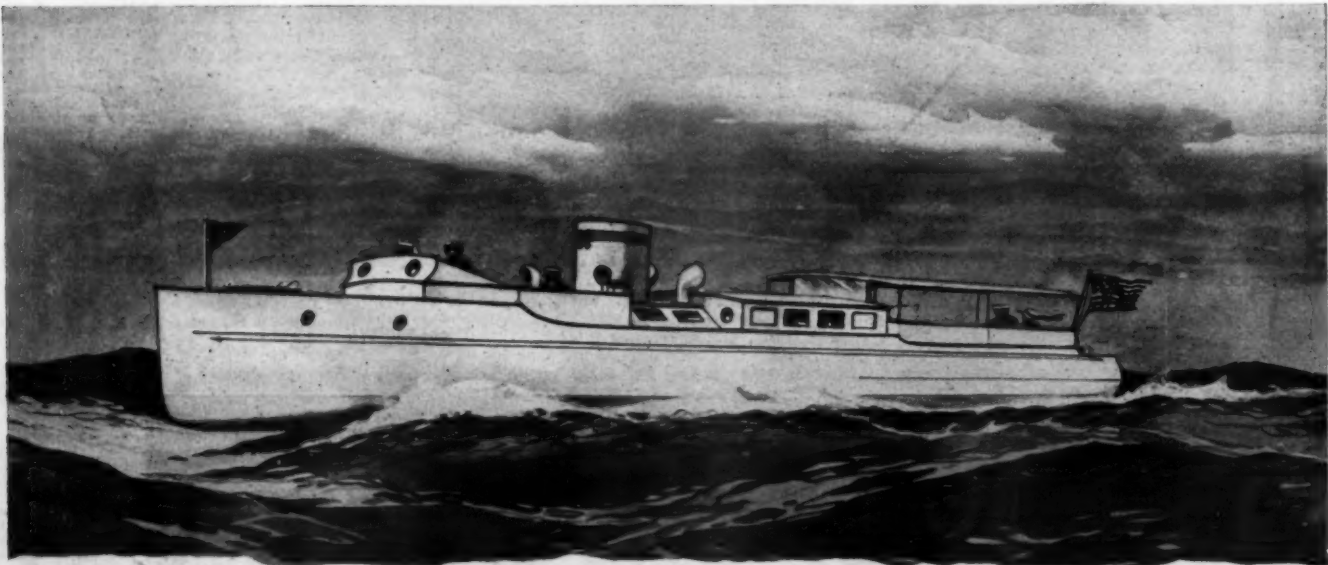
with the cylinders of the finest close-grained gray iron, and the pistons are of the same material; the connecting rods are of I-beam section drop-forged from 30 per cent. carbon steel; the crankshaft is of the highest grade open hearth 35 to 45 per cent. carbon steel, double heat treated, pickled and ground; the camshafts are also of drop-forged steel with the cams forged integrally and accurately ground to master cams. The upper half of the crankcase is made of a single aluminum casting of special alloy and supports the crankshaft and other moving parts. The lower crankcase is of the same material and has an extension for the reverse gear as well as thrust bearing, making a rigid unit. Lubrication is by means of a gear pump forcing the oil from a reservoir attached to the front end of the motor to a main duct from which it is distributed by means of smaller ducts to the main bearings, and from here it is forced through a hollow crankshaft to the connecting rod bearings and thence into the lower case. A gear pump is also used for the water circulation, and it is provided with two grease cups and ample stuffing boxes, and is guaranteed against leakage. All of the work on Wisconsin motors is done by jigs and special tools, and all parts are interchangeable.

The exhibit of the **Murray & Tregurtha Co.**, of South Boston, Mass., includes several of this concern's regular line of medium-duty engines and a small electric lighting outfit. The electric lighting outfit, which is being used with success on a great number of motor yachts, consists of a direct-connected set mounted on one base. The dynamo is driven by a two-cylinder Murray & Tregurtha motor having exhaust valves in the side and automatically operated intake valves in the head. This motor is equipped with a Schebler carburetor and a governor for maintaining the speed constant regardless of the load. Murray & Tregurtha motors are built in two, four, five and six-cylinder sizes, and range in power from 4 to 200 h.p. These motors are all of the four-cycle type and may be equipped with either make and break or jump spark ignitions. All models over the 18 h.p. size are regularly fitted with governor and water pump. Two of the most popular sizes are the 18 and 40 h.p. auto-marine models having four cylinders with dimensions of  $4\frac{1}{2}$  x 5 and 6 x 6 inches, respectively. These motors operate at a speed of 800 r.p.m. and are intended for installation in high-class runabouts and small hydroplanes.

The Murray & Tregurtha booth will also be headquarters for information regarding the well-known Sea Sled for which this company is the agent in the United States.

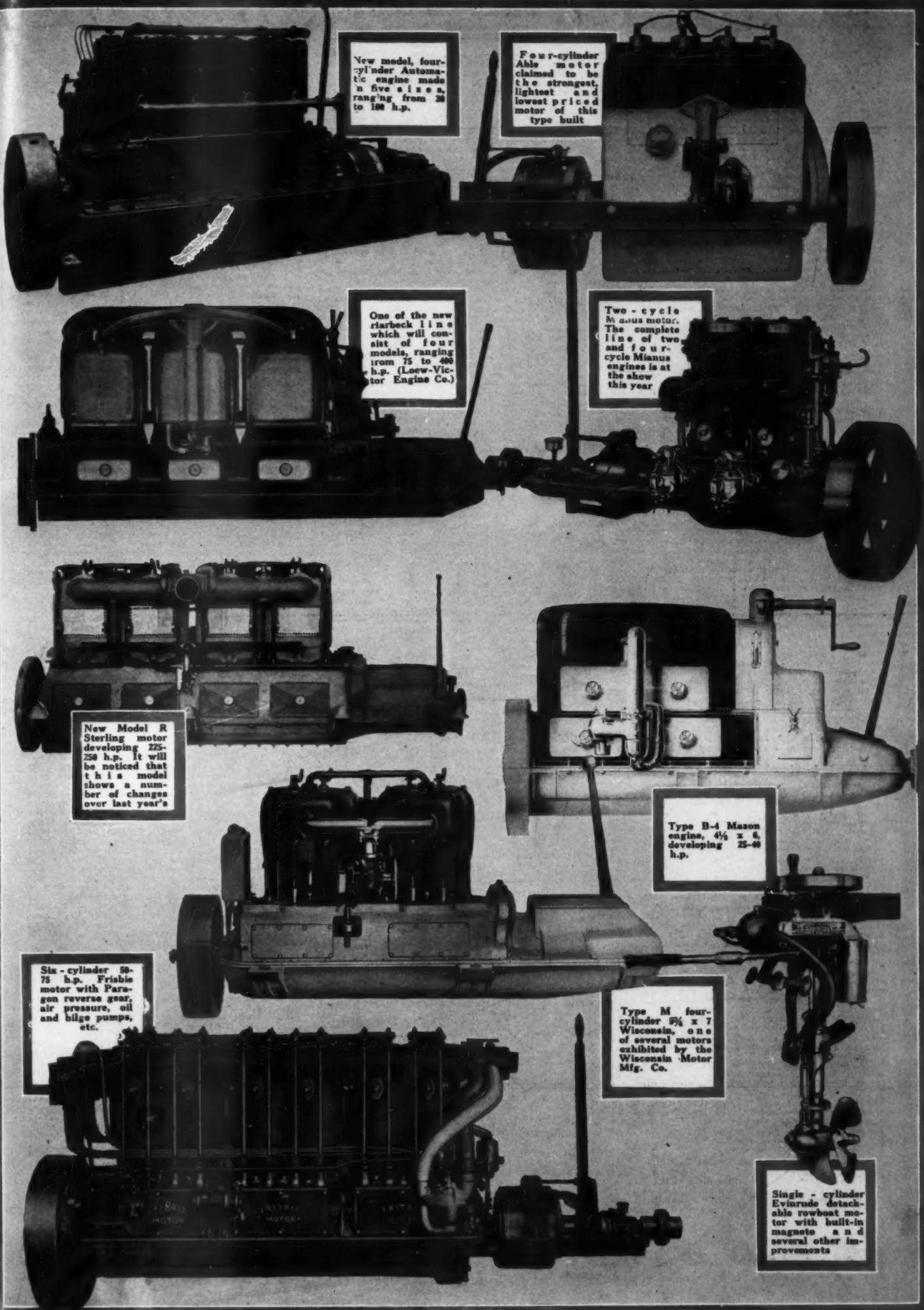
By far the most important item of the exhibit of the **Loew-Victor Engine Co.**, of Chicago, Ill., is the new high-speed Harbeck engine which has only recently been put on the market. This motor is sure to attract universal attention because it embodies for almost the first time the Duesenberg horizontal valve-in-head principle, a design permitting, it is said, the maximum power per cubic inch of piston displacement. The introduction of the valves in the cylinder heads as mentioned gives exceptional free gas passages and small area of combustion chamber walls. This small wall area minimizes the dissipation of the heat unit, thus increasing the horsepower and permits the use of higher pressure than obtains in conventional practice.

The cylinder and valve design is declared to permit of an unusually simple valve action. The cylinders are cast in pairs and are amply water jacketed;



Sixty-foot express cruiser built by the Mathis Yacht Building Co., Camden, N. J., for James Elverson, of the New York Yacht Club; designed by Swasey, Raymond & Page. It will be powered with two eight-cylinder 300-400 h.p. Duesenberg design Harbeck engines built by the Loew-Victor Engine Co.





New model, four-cylinder Automatic engine made in five sizes, ranging from 30 to 100 h.p.

Four-cylinder Able motor claimed to be the strongest, lightest and lowest priced motor of this type built

One of the new Starbeck line which will consist of four models, ranging from 75 to 400 h.p. (Loew-Victor Engine Co.)

Two-cycle Mianus motor. The complete line of two and four-cycle Mianus engines is at the show this year

New Model R Sterling motor developing 225-250 h.p. It will be noticed that this model shows a number of changes over last year's

Type B-4 Mason engine, 4 1/2 x 6, developing 25-40 h.p.

Six-cylinder 50-75 h.p. Frisbie motor with Paragon reverse gear, air pressure, oil and bilge pumps, etc.

Type M four-cylinder 5 1/2 x 7 Wisconsin, one of several motors exhibited by the Wisconsin Motor Mfg. Co.

Single-cylinder Evinrude detachable rowboat motor with built-in magnets and several other improvements

## The 1916 Motor Boat Show

the pistons are of magnalium metal and are very light in weight and strongly braced to prevent breakage. Each piston is balanced with every other piston in the same engine. The piston pins are of alloy steel tubing, case-hardened and ground, the pins being rigidly clamped in the connecting rods and oscillating in the piston bearings. The valves are of tungsten steel of 3/8-inch diameter and are actuated by means of rocker arms driven from the camshaft. They are set horizontally in the cylinder head. The valve rocker arms are of drop-forged steel and the camshaft end is fitted with a roller contact, while the valve end has an adjusting screw and lock nut. The entire valve actuating mechanism is completely enclosed in an oil and dirt-proof housing, the latter being readily removed for inspection or adjustment of the parts. The connecting rods are of I-beam section drop-forged from chrome vanadium steel, and the crankshaft is of hammer-forged alloy steel 2 1/4 inches in diameter. The main and connecting rod bearings, camshaft, rocker arm bearings and gears are lubricated by a high pressure circulating system. The crankshaft is driven hollow from the main bearings to the connecting rod bearings.

The oil is circulated and returned by gear pumps, and in addition to this pressure system a constant and variable level splash system is provided, the level being under the control of the operator. Strainers are provided for the thorough cleansing of the oil before it is delivered to any bearing. It is stated that 400 h.p. hours are obtained from a gallon of good quality lubricating oil. The main oil supply aside from that contained in the crankcase proper is carried in an oil tank mounted in the engine-room. The oiling system as incorporated in the Harbeck motors provides for the positive lubrication under pressure of every moving part with practically a duplicate system for speed work.

These motors have a bore and stroke of 6 1/4 x 7 1/4 inches and the six-cylinder size has a guaranteed power of 300 h.p. at 1,500 r.p.m., while the eight-cylinder motor delivers 400 h.p. at 1,500 r.p.m.

A booth which is sure to attract considerable attention at the Palace this year is that occupied by the **Able Engine Co., Inc.**, of 30 East Forty-second St., New York City. This concern is exhibiting its Able motor in four and eight cylinders, and an interesting feature of the display is the disassembled four-cylinder motor which one of the attendants will be glad to move around to show you the lightness of the various parts. Lightness in relation to the power developed is one of the most conspicuous features of this motor, and this is made possible by the method of enclosure. Replacing the valve stem enclosures on the upper part of the crankcase in the ordinary motor is a single sheet of metal; this, so to speak, is wrapped around the block, making a tight joint with the cylinder castings at the top to which it is bolted and remaining open at the bottom. Removable plates are provided in the housings to give access to the valve stems and cams, and provision is made to hold these securely in place without rattling and without oil leakage. The crankcase is merely a rectangular box of drawn steel into the lower part of which is forced a false bottom having four transverse depressions to serve as troughs for the connecting rod oil scoops. The ends of the crankcase are cut away to allow it to fit up over the crankcase bearings. The crankcase fits outside the main enclosure to obviate gaskets and at the same time eliminate rattling and throwing of oil. A third enclosing member consists of a housing in two parts for the timing gears. The inner section of this housing is secured to the cylinder casting by three bolts, while the outer section or cover is secured by a single bolt and may thus be readily removed. Another unusual feature of this motor is found in the cylinder casting where by a special design it has been possible to cast even the intake and exhaust manifolds into the cylinder casting, water-jacketing both of them. Thus, there are no bolts used in the construction of the cylinder block and of course gaskets are unnecessary. The cylinders are of T-head design and it is interesting to compare the valve size with that of the cylinder bore. With a stroke of 4 inches the diameter of the cylinder is 2 1/4 inches, and yet the inlet and exhaust valves are 1 1/4 inches, more than half the diameter of the bore, while the exhaust pipe is 1 1/2 inches through. The pistons weigh less than one pound each. The piston pins are of vanadium steel and are slightly offset to balance the diagonal throws of the connecting rod, thus reducing friction and eliminating piston slap. The connecting rods are drop-forged from steel and are designed with a factor of safety of nine. The crankshaft is 1 1/2 inches in diameter of drop-forged steel, heat-treated and ground. It is a two-bearing shaft, but the bearings are only 13 inches apart. The shaft runs on Hyatt roller bearings and at full speed turns up to 2,000 r.p.m. The camshafts are cast with the cams integral and measure one inch in diameter. The Splitdorf Dixie magneto is furnished as standard equipment and a float-feed carburetor is used.

The four-cylinder motor weighs only 136 pounds without reverse gear and measures 14 1/2 inches in length by 7 1/4 inches in width. The piston displaces 89 cubic inches and the motor is rated at 17.6 h.p. The eight-cylinder motor is of the V-type, being composed of two four-cylinder blocks set at an angle. This motor without reverse gear weighs 220 pounds and its power rating is figured at 35-40 h.p. at normal running speed.

**The New London Ship & Engine Co.**, of Groton, Conn., is exhibiting one of its well-known Nisco Diesels at the end of the center aisle of the Palace. The motor shown is the 120 h.p. model, and some of the most important details of its construction are as follows: The engine is of the vertical, single-

acting four-cycle type working on the Diesel principle and burning fuel oil. Reversing is accomplished by means of a heavy-duty type of mechanical reverse gear and clutch. The engine has four working cylinders 9 inches in diameter and 12 1/2 inches in stroke and develops 120 h.p. at 350 r.p.m. At the forward end of the engine there is an air compressor for supplying air for injecting the fuel and for starting purposes, provision being made on the working cylinders for starting the engine by means of compressed air. The bed plate is in one piece, of cast iron, and is enclosed to catch all oil draining from the bearings. Flanges are provided on the bottom for bolting to the foundation and on the top for carrying the housing.

The working cylinders are of cast iron with water-jacketed barrels and heads. The cylinder heads are cast integral with the barrel and contain all the valves. Each cylinder has an inlet valve and a relief valve on the front of the engine, a spray valve on top and an exhaust valve on the back. The inlet valve is of forged steel and is carried in a separate cage. The exhaust valve has a steel stem with a cast iron head of special design to withstand the action of the hot exhaust gases. The spray valve has a steel needle with atomizer and cage of special design. The two camshafts, carried in white metal lined cast iron bearings on the top of the housing, are driven from the crankshaft by means of spur gears on the after end of the engine. The camshaft on the back of the engine operates the exhaust valves by means of rocker levers. The camshaft on the front of the engine operates the inlet valves by means of rocker levers and the spray valves by rocker and bell crank levers. Two of the cylinders are fitted with air starting valves operated from the front camshaft. The operating gear of these valves is so arranged that when they are in operation the spray valves on these cylinders are cut out, and when the spray valves are operating, the starting valves are cut out. The fuel system consists of a pump located at the forward end of the engine and driven from the front camshaft extended, with a separate plunger for each cylinder. Fuel is supplied to this pump from a gravity tank which is divided into two parts with a filter between so that no foreign matter can get to the fuel pumps. The discharge from each individual fuel pump leads to its respective spray valve. The speed of the engine is controlled by the amount of fuel supplied to the cylinders, which in turn is controlled by the timing of the individual pump suction valves.

**Wheeler & Schebler**, of Indianapolis, Ind., manufacturers of the Schebler carburetor, have a very interesting display at the show this year and are featuring their D, L, L Dash control and R models. They also show the Schebler hot air drum and tubing, strainers, etc. Schebler carburetors are made in various sizes and each model is especially adapted for various types of motors. The Model D is the original Schebler and is suitable for single-cylinder or double-opposed motors, and all engines where extreme low throttling conditions are not required. The air intake and throttle are interchangeable and connections can be made to either horizontal or vertical manifolds. The Model R is a single-jet needle type designed for use on both four and six-cylinder models. The Model L is for high-speed motors where low throttling is not required and speed is desired. Other features of this exhibit include the Model T carburetor which is a horizontal type instrument, and the Model D, which has recently been designed for use on outboard motors.

**The Motor-Compressor Co.**, of Newark, N. J., is showing one of its "Perfect" starters fitted to a heavy-duty six-cylinder motor. This starter is one which was introduced last year, and which is declared to have had considerable success. It is an air starter, and although a small device is stated to embody every feature known to science to produce efficiency not only as a compound engine when acting as a starter but also as a two-stage air compressor. These two functions are combined in one instrument, the operator controlling both at will from his position at the wheel. It is of the four-cylinder V-type construction, the two high pressure cylinders being on one side and the two low pressure on the other. When the air is led to the high pressure cylinders its normal power is stated to be sufficient to turn over the heaviest motor, and by allowing the air to enter directly into the low pressure receiver about twice the normal power is obtained. It spins the motor at sufficient speed to prevent slackening at the point of compression, and it is designed to turn over a motor at a speed of 300 r.p.m. As a two-stage air compressor it will in three minutes' time compress air in a suitable tank to a pressure of 300 pounds.

**Edward Smith & Co.**, of Long Island City, N. Y., have a very interesting exhibit portraying a scene at the Panama Exposition with a lagoon in which there is a miniature motor cruiser propelled and lighted by electricity and finished with this concern's Marine white enamel, Spar coating and Marinite. There are also on display panels of rare wood showing these various compositions and also I. X. L. No. 1, a varnish for interior work. No new varnishes are offered this year as the company believes its line is complete.

The exhibit of the **Pyrene Mfg. Co.**, of New York City, is always an interesting one, as this concern in addition to displaying its various types of Pyrene extinguishers and holders is willing and ready to demonstrate the efficacy of its product. Pyrene is declared to be a particularly valuable extinguisher for use aboard a boat, as it is a non-conductor of electricity, and as the liquid when played from the container may be directed into al-

most inaccessible places which it would be hard to reach with other forms of fire fighters. The liquid is stated to be non-corrosive and non-damaging, and it will not freeze at any temperature liable to be met with in our climate.

**The Wicker-Kraft Co.**, of Newburgh, N. Y., is not making any exhibit of its own this year, but nearly all of the large boat owners including the Elco Co., Chas. L. Seabury & Co., Geo. Lawley & Son Corp., Luders Marine Construction Co., Niagara Motor Boat Co. are equipping their show boats with Wicker-Kraft chairs. One of the most popular chairs in this line is one in which it is possible to stow a life preserver beneath the seat, thus making this part of the boat's equipment easily accessible at all times and keeping it neat and clean. Wicker-Kraft chairs are put out in a great variety of styles for interior and deck use and the line also includes tables in several types, settees, tête-à-têtes, etc.

The exhibit of the **Splitdorf Electrical Co.**, of Newark, N. J., is an unusually large one this year, as it comprises the various lines handled by this company and by the **Apple Electric Co.** and the **Sumter Electrical Co.** as well. The Dixie magneto which is part of the Sumter Company's line is a distinctly new type of magneto, having nothing in common with the rotary armature idea or with the well-known inductor types. In this magneto the rotating member consists of two pieces of magnetic material separated by a non-magnetic center piece. This member constitutes a true rotating pole for the magnet and rotates in a field structure composed of two laminated field pieces riveted between two non-magnetic rings. The bearings for the rotating poles are mounted in steel plates which lie against the poles of the magnet. When the magnet poles rotate the magnetic lines of force from each magnet pole are carried directly to the field pieces and through the windings without reversing, through the mass of the rotating member and with only a single air gap. There are no losses by flux reversal in the rotating part, and to this fact is attributed the high efficiency of the instrument. Dixie magnetos are now made in several styles for marine motors. These magnetos are of the true high tension type and the low tension magnetos manufactured by the Sumter Company are distinguished by the trade name 3-M.

The Apple Electric Co.'s line of starting and lighting systems adapted for marine use consists of A-25, A-27, A-28 and A-29 single unit systems and a two-unit system. Some interesting details of the two-unit system are as follows: The starting motor is so designed that when the operator pushes the starting pedal or pulls a lever a gear is carried into engagement with the gear on the flywheel and as the engagement is made, current is supplied to the electric motor. The gear is carried on the armature shaft by spiral splines so that the act of cranking the engine tends to hold it in mesh. When the engine starts on its own power it turns faster than the motor pinion which is in mesh with the flywheel, and on account of the spiral splines it is forced out of engagement. The gear, while drivingly carried on the armature shaft, is also mechanically connected to a drive rod which engages one of the switch rods, and as the gear is carried out of mesh with the flywheel the switch rod is pulled with it and the motor circuit is opened with a quick break so that no arc is formed, thereby giving long life to the switch contacts.

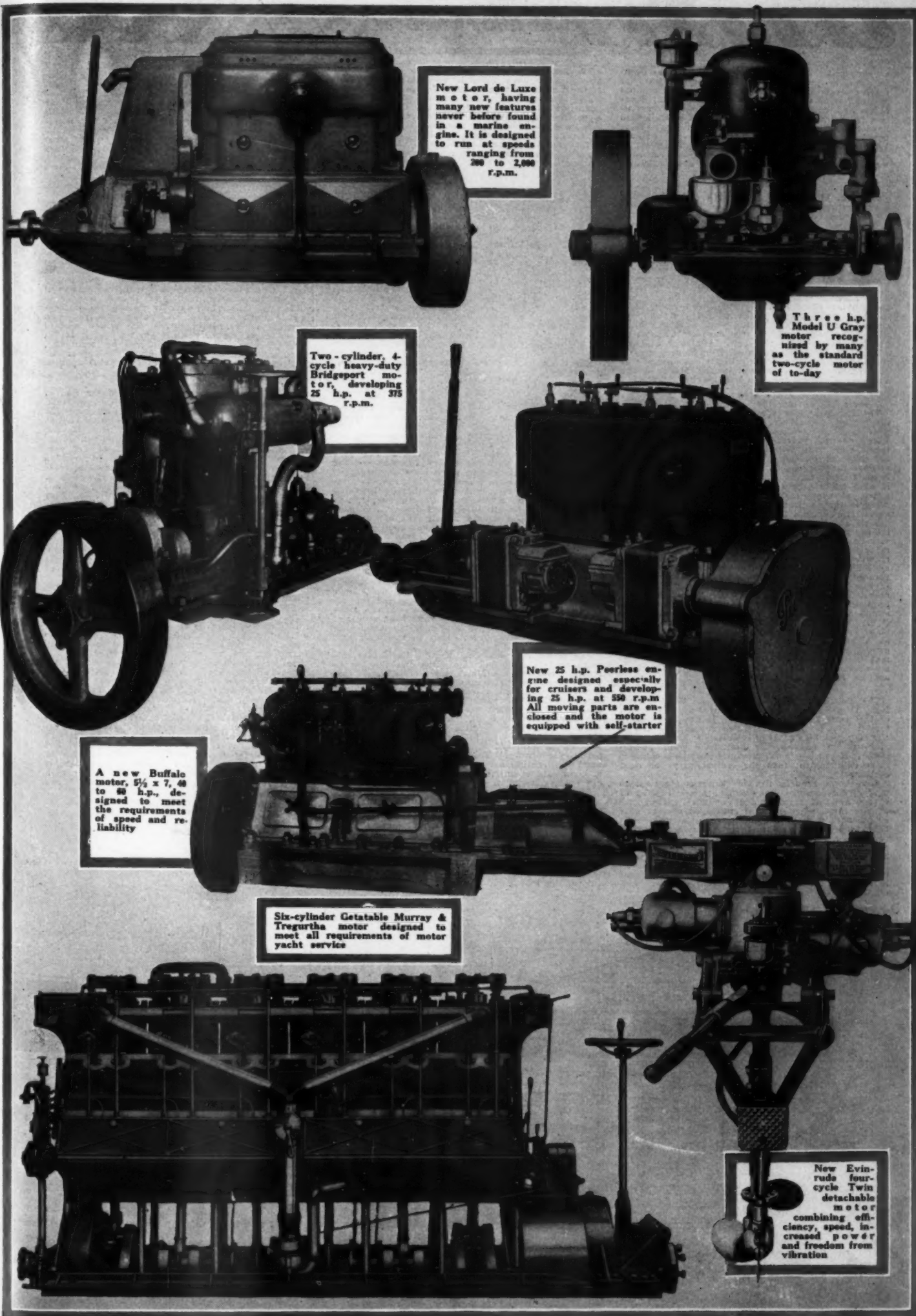
**The Ericsson Mfg. Co.**, of Buffalo, N. Y., is showing at New York this year for the first time. This company has catered to the marine trade for only a short time, but its success in this line is considered remarkable. One of the most important of its line of Berling magnetos is an eight-cylinder two-spark instrument which has been used on the Sterling Model F motor and on Van Blerck high-speed engines. This model is also produced and shown in four and six-cylinder sizes and a wide general application is anticipated for it. All parts of this type of magneto are enclosed in a frame consisting of one solid casting, embodying the base, top, sides and driving end bearings, protecting the working parts from oil, dust and water. One of the principal features of Berling magnetos is the quick, snappy action at slow as well as at high speeds. This two-spark magneto has been produced after the most exhaustive experimentation, and the parts and workmanship entering into its construction are of the finest.

The exhibit of the **Talbot Boiler Co.**, of New York City, consists of one of this concern's Talbot boilers for a super-heating steam power plant. This boiler is declared to be exceedingly compact and powerful and to operate with the greatest safety and efficiency. Durability is another feature of the Talbot, while flexibility of control is claimed as a very strong point for it.

**The E. J. Willis Co.**, of New York City, is occupying spaces 25 and 26 on the mezzanine floor and in addition to the famous Caille five-speed outboard motor is exhibiting a full line of accessories and electric features for the motor boat, and is showing a number of new things and devices for the coming season, among them being sailing lights for both Class 1 and Class 2 boats. Bryant & Berry propellers, which are made in a variety of sizes for high-speed work, are a part of the exhibit. This B. & B. wheel is three-bladed, the blades being made with a differential pitch and a concave curve from the hub to the edge. The Yankee marine silencer is also a prominent part of the Willis display.

**The David B. Crockett Co.**, of Bridgeport, Conn., is exhibiting its leading varnishes, the most prominent of which are Spar Composition, No. 1 Pre-





New Lord de Luxe motor, having many new features never before found in a marine engine. It is designed to run at speeds ranging from 200 to 2,000 r.p.m.

Three h.p. Model U Gray motor recognized by many as the standard two-cycle motor of to-day

Two-cylinder, 4-cycle heavy-duty Bridgeport motor, developing 25 h.p. at 375 r.p.m.

New 25 h.p. Peerless engine designed especially for cruisers and developing 25 h.p. at 550 r.p.m. All moving parts are enclosed and the motor is equipped with self-starter

A new Buffalo motor, 5½ x 7, 40 to 60 h.p., designed to meet the requirements of speed and reliability

Six-cylinder Gettable Murray & Tregurtha motor designed to meet all requirements of motor yacht service

New Evinrude four-cycle Twin detachable motor combining efficiency, speed, increased power and freedom from vibration

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servative and Waterproof Floor Finish. Spar Composition is prepared especially for all exterior marine work and is declared to be proof against salt and fresh water, while it possesses great durability and will not turn white. No. 1 Preservative is an interior finish which can be washed with hot or cold water and soap without injury. It is not subject to cracking, blistering or scaling. Waterproof floor finish is an elastic, durable varnish which is waterproof and is especially adapted for cabin floors inasmuch as it will not show heel marks.

Chas. E. Miller, of New York City, is displaying a very representative line of motor boat accessories of all types, among which are the products of the Lobee Pump & Machinery Co., Buffalo, N. Y., and of the Gray-Hawley Mfg. Co., of Detroit, Mich. Lobee circulating pumps are of both gear and rotary types, and are well known in the marine trade. High-class bilge pumps for flywheel operation are also a part of this same line. One of the leading features of the Gray-Hawley Company's line is its combination flagpole and electric light. This flagpole which is shown in one of the accompanying illustrations is made of a solid piece of wood with electric wires passing through the center connecting at the top with a Mazda bulb, and at the bottom with a special socket with waterproof switch. Over the bulb is placed a globe which can be easily removed if necessary to replace the bulb. The running lights put out by this concern are also a feature in the Miller booth. Thermex silencers are also handled by Miller.

The Paragon Gear Works, of Taunton, Mass., is displaying as usual the various types of its reverse gears and also one of the slide-operating types of Paragons with part of the case cut away so that the motor boat enthusiast can see for himself the internal operation of the gear. This shows at once the working of the multiple principle which is such a strong feature of the Paragon gear, and it also makes plain the working of the internal gears, showing exactly what happens when the lever is thrown from the forward drive to the reverse. In addition to the speed gears and enclosed models the new yoke-operating type Paragon with its ingenious stop links is also exhibited. This device has no lower link such as some of the former models had, and this feature not only enables the manufacturer to save room, but obviates any possible chance of a part of the gear becoming rusted through immersion in bilge water. Another advantage of this yoke-operating model is that the lever may be placed either on the port or starboard side. Stop links form a part of the operating mechanism and securely hold the lever in the forward position. The Paragon people feel that the unit power plant is coming more and more into demand, and as a matter of fact marine engine builders are generally extending their engine beds so that they may install their reversing device as a part of the power plant. This new Paragon model is especially adapted to this kind of installation.

The Smith-Serrell Co., Inc., of 90 West street, New York City, has at the show this year much of the same type of display as it has had during former shows. This consists of a complete line of Francke flexible couplings suitable for all sizes of motor boat engines. By means of a special mounting it is shown how much freer the Francke coupling is from misalignment than the ordinary type of rigid coupling.

In general Francke flexible couplings are used to prevent hot bearings, leaky stuffing boxes, binding of shafts and all misalignment troubles. They are usually installed just aft of engine or reverse gear in place of a rigid coupling. The design is such that propeller thrusts and reverse pull are taken care of by a center bolt, so that the driving parts are relieved of these strains and an extra thrust bearing is unnecessary. Standard and light weight types are provided for all sizes of displacement boats and hydroplanes, and the heavy pattern type is intended for all types of direct connected machines.

The Smith-Meeker Engineering Co., of 133 Liberty street, New York City, is operating the exhibit of the Edison Storage Battery Co., of East Orange, N. J., in connection with its own. The exhibit this year is slightly reminiscent of the Panama-Pacific Exposition, as the Smith-Meeker Company has on display a switchboard and one large sample board of marine fixtures which has been on exhibition out at the Coast for the last year. These are intended to show the most modern and up-to-date method of yacht lighting and power control and marine water-tight fixtures. The Edison storage battery in all its different types and constructions as applied to ignition, lighting and power for motor boats of all sizes is shown, and some of the other features include small generating sets of the direct-connected type with control panels for them as well as incandescent and arc searchlights.

The Chicago Varnish Co., Hudson Terminal Bldg., New York City, is conducting its display of marine finishes in a quite dignified way, showing a model of a boat finished with Navalite in a glass tank entirely immersed in sea water, emphasizing the fact that this preparation will not turn white. There is also a boiling test to prove that Navalite is not affected by salt, hot or cold water. This company will also distribute its famous souvenir postal cards showing a girl at the steering wheel of a yacht, on which wheel there is an inscription, "Let Me Steer You Right; Use Navalite."

The Henricks Magneto & Electric Co., of Indianapolis, Ind., is showing through its eastern representatives, the Suttell-Madsen Co., of 136 Liberty street, New York City, a full line of motor boat outfits, starting and lighting systems for motor boats, magnetos for stationary or marine engines, etc. One of the most recent Henricks generators is the 1916 Eureka Model BC-4. An important feature of this improved generator is a unique mechanical cut-out which entirely eliminates pitting of contact points for the reason that none are used to break the circuit between the generator and the battery. When the engine stops or when the speed drops below a certain minimum, the brush is simply lifted from the commutator, thereby breaking the circuit. The contrivance is very simple, and is declared to be absolutely fool-proof. The generator is equipped with a flyball type of governor which keeps it down to a constant speed of 2,200 r.p.m. at which point it is designed to deliver 6 to 7 amperes at 6 volts. Other interesting items of the display at this booth are the Apex side and stern lights, switchboards, etc.

The Snow & Petrelli Mfg. Co., of New Haven, Conn., has its space this year on the main floor on the Lexington avenue side and is making its usual exhibit of reverse gears, rear starters, one-way clutches, etc. It has also something new and interesting in the way of a transmission which is expected to fill a long-felt want in marine usage.

The Bosch Magneto Co., of New York City, always devotes a good deal of time and thought to making its show exhibits interesting, and this year's display is no exception to the rule. A large number of magnetos of various types is shown and some of these instruments are so mounted that the visitor may turn the armature by hand and see the effectiveness of the spark even at low speeds. The Bosch lighting and starting systems are shown as applied to marine motors, and the new Bosch standard lighting system is given especial prominence. This system is designed to meet the lighting needs of the modern motor boat and consists essentially of but four units—a storage battery, a dynamo, a switch and a control box.

The dynamo is supplied in two sizes rated at 80 and 100 watts, respectively. Both types, however, are intended to operate in connection with a 12-volt storage battery. The control box contains the resistance coil, the automatic cut-out and the main and field fuses. The types of switches are provided for use with this lighting system and both are fitted with a locking arrangement whereby they may be locked and the key removed in any of the four positions.

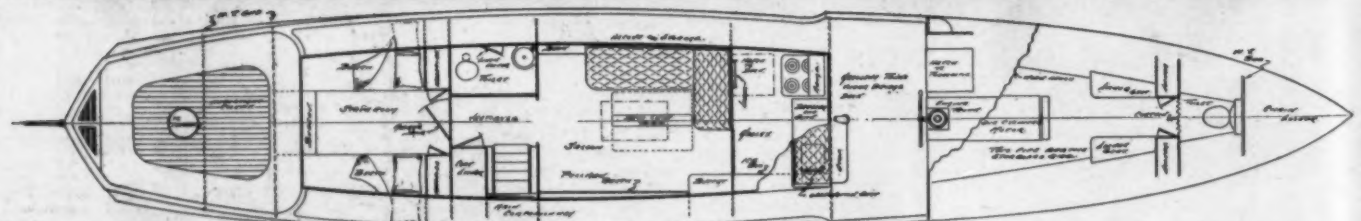
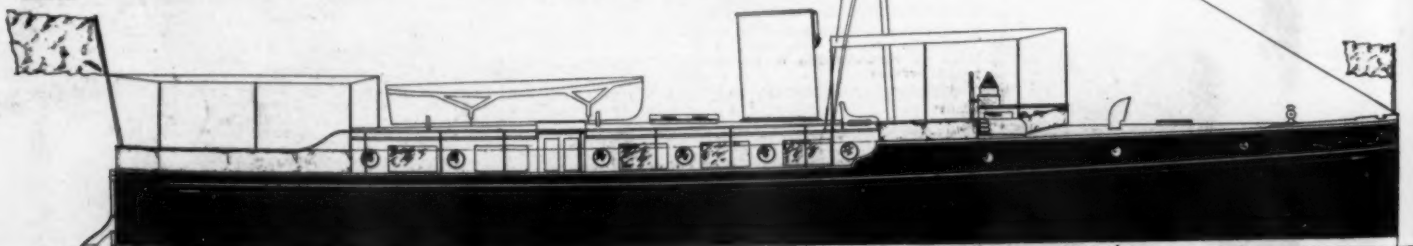
Byrne, Kingston & Co. and the Kokomo Electric Co., of Kokomo, Ind., are as usual combining their exhibits at this year's show. One of the features in the Kingston line of carbureters is the new enclosed type which is declared to give 100 per cent. efficiency at all times. This enclosed model is made for all sizes and types of engines and is declared to be absolutely up-to-date, having been designed for the poor grade of gasoline which must be accepted to-day. Kingston electrical specialties include the Kingston mica plug, Kingston magnetos, coils, etc. The magnetos are made in several sizes for both jump spark and make and break, and are constructed of the best materials obtainable. The magnets are of the best quality steel and the armatures are of the H type with laminated centers.

As in former years, the display of the Debevoise Co., of Brooklyn, N. Y., emphasizes this company's marine paint specialties, with the most attention directed to its Marine Flat White. The exhibit consists of numerous panels showing various different paints, the largest of which is covered with Flat White. One of the principle features claimed for this composition is that it is not subject to cracking or blistering, thereby making it unnecessary to burn or scrape old paint coatings when preparing for refinishing boats with a new coat of paint. It gives a very white surface and it is declared that it will not be injured by scrubbing, although this humble process gives the appearance of there having been a new coat of paint applied.

The exhibit that the Van Blerck Motor Co., of Monroe, Mich., has at the show is full of interest. The dominant feature of the exhibit is Flyaway III, which is shown for the first time. Flyaway III has created such a unique record during the past two seasons that every man, woman and child interested in motor boating has read of her performances, and it will be a rare treat to have an opportunity of actually inspecting this boat at close range. Flyaway III is 38 x 8 feet 4 inches x 32 inches, was designed by Wm. H. Hand Jr., and was built by the Miller Shipyard & Repair Co., City Island. Originally designed and built for Thomas B. Taylor, of Fort Washington, L. I., she is now owned by F. L. Upjohn, of Huntington. During the past two seasons Flyaway has been equipped with a six-cylinder 5½ x 6-inch Van Blerck turning a 22 x 25-inch Ailias Craig wheel at 1,100 r.p.m. That this express cruiser type of boat has caught the public fancy is evidenced by the large number now under construction.

The big, outstanding feature of the Van Blerck exhibit is the twelve-cylinder V-type Model H-12 motor developing 400 h.p. at 1,400 r.p.m. This is a 6 x 7-inch overhead valve, enclosed type of express cruiser and hydroplane motor that the Van Blerck Co. is offering for the 1916 season. It weighs 2,600 pounds with complete engine equipment, including electric starters, air pump, tachometer, etc.

Another important feature of the Van Blerck exhibit is an eight-cylinder Model E-8 5½ x 6-inch machine equipped with a reduction gear whereby the engine operates at 1,800 r.p.m. and the propeller at 500 r.p.m. A 40 x 40-inch three-bladed wheel is shown as part of this outfit. The interest aroused by the installation of several gear reduction outfits during the past year should make this particular display of special interest to many visitors at the show. A regular eight-cylinder Model E-8 5½ x 6-inch 135-180 h.p. motor is exhibited with an electric starter and regular equipment and there is also a standard six-cylinder Model E-6 motor with electric starter and regular catalog equipment and



Sixty-foot cruiser built by the Luders Marine Construction Co., the largest ever exhibited at any show



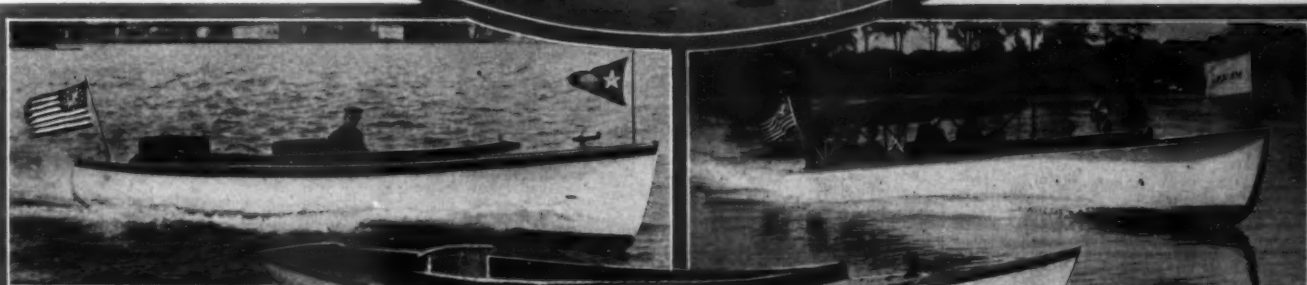
# Boats Exhibited at the Show

One of the boats  
built by the Gas En-  
gine & Power Co., and  
Charles L. Seabury Sons,  
of Morris Heights, N. Y.

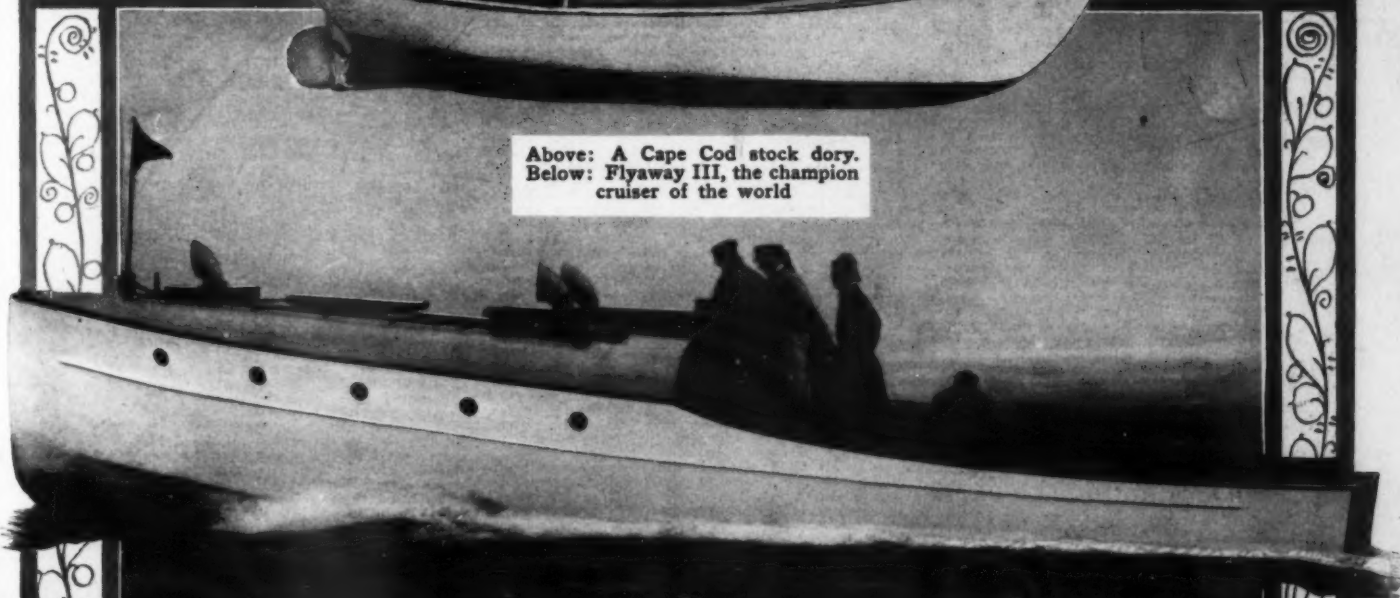


A Fay & Bowen stock runabout,  
powered with a Fay & Bowen motor

A 19-mile runabout, built by  
the Niagara Motor Boat Co.



Above: A Cape Cod stock dory.  
Below: Flyaway III, the champion  
cruiser of the world



Above: The 30-foot Elco Express  
Below: Twenty-two foot Toppan Government boat

Coronet, Frederick K. Lord's displacement runabout,  
powered with a Lord de Luxe motor

## The 1916 Motor Boat Show

a four-cylinder Model E-4 motor similarly equipped. These two motors constitute the backbone of the Van Blerck line and are a standardized product throughout.

Two of the Van Blerck commercial engines are also on exhibition—one a six-cylinder and the other a four-cylinder machine, both with  $3\frac{1}{2}$  x 6-inch cylinders; and last, but not least, a twelve-cylinder aeroplane motor is exhibited. This is a V twelve-cylinder  $4\frac{1}{2}$  x 5-inch motor developing 185 h.p. at 1,400 r.p.m. and weighing 580 pounds complete. Not a pound of aluminum is used in the construction of these motors, it being characterized as the all-steel engine. Rex W. Wadman will be in attendance at the exhibit the entire time of the show, assisted by F. B. Sexton, W. A. Peddie and H. L. Sparrow. Joseph Van Blerck, president of the company, will be in New York during the entire show and will frequently be in attendance at the exhibit.

The exhibit of the Buffalo Gasoline Motor Co., of Buffalo, N. Y., occupies space G on the Forty-seventh street side of the Palace, and the fact that more space is allowed than was possible at the Garden gives a better opportunity for display than other years.

The exhibit is representative of the whole Buffalo line of slow, medium and high-speed engines. Most impressive in point of size at least is the big four-cylinder 80-100 h.p. heavy-duty engine weighing 2,200 pounds with 10-inch bore and 12-inch stroke. This is one of the biggest engines in the show and the second largest in the Buffalo "herd," the largest being a six-cylinder model of the same dimensions. The engine shown this year is similar to the one exhibited last year except that a larger and more powerful clutch has been added.

Two sizes of Buffalo cruiser and runabout engines are also shown. This is the latest Buffalo design and both are four-cylinder models. The smaller having  $5\frac{1}{2}$ -inch bore and 7-inch stroke is rated at 40-50 h.p. and the larger with  $6\frac{1}{2}$  x 9-inch bore and stroke is rated at 50-80 h.p. Both of these models were specially designed to meet the requirements of boats such as fast cruisers and the larger type of runabouts wherein speed must be combined with reliability.

Both of the Buffalo Auto-Marine models are also shown—the 16-20 h.p. and the 25-30 h.p. These are fairly high-speed engines built for powering runabouts and speed boats. The smaller size has  $3\frac{1}{2}$ -inch bore and 5-inch stroke and the larger  $4\frac{1}{2}$ -inch bore and 5-inch stroke. They are neat, compact and serviceable to a fault and form one of the most popular of the Buffalo styles.

In addition to the big 10-inch x 12-inch model the well-known line of Buffalo heavy-duty engines is represented by a two-cylinder model with 5-inch bore and  $6\frac{1}{2}$ -inch stroke rated at 10-12 h.p., and a four-cylinder model with 6 x  $7\frac{1}{2}$ -inch bore and stroke rated at 26-30 h.p. These two engines give a good idea of Buffalo heavy-duty construction and the qualities which have made these engines so successful among work boats, yachts and large cruisers.

The feature of the exhibit of the Peerless Marine Motor Co., of Buffalo, N. Y., this year is a new Peerless engine designed especially for cruising purposes. This engine develops 25 h.p. at 550 r.p.m. and 30 h.p. at 700 r.p.m. The design is most modern, every part including the flywheel being enclosed. All gears have been eliminated, the camshaft, generator, etc., being driven by silent chain. This machine is equipped with a two-unit electric starting and lighting system built in. Great care has been exercised in the design and construction of this latest Peerless production. Its beauty, simplicity, quietness and smoothness of operation will be appreciated by all of its users. A careful balancing of all the reciprocating parts results in an almost total lack of vibration. Although the design throughout is very strong and rigid, the engine is not excessively heavy. The standard engine with iron crankcase weighs 80 pounds. By substituting an aluminum base the weight can be reduced to 60 pounds.

The cylinders are cast en bloc, making it possible to eliminate all water manifolds. The intake and exhaust manifolds are made in one casting, rendering it easy to thoroughly heat the incoming mixture—which results in great economy. The crankcase is of one-piece design and the crankshaft can be easily removed from the front end of the engine. The flywheel and the silent chain drive for the camshaft are contained in the flywheel housing entirely separate from the crankcase and easily accessible. Water circulation is accomplished by means of a special plunger pump with exceptionally large check valves to make it noiseless. A ratchet-driven Detroit force feed lubricator feeds oil directly to the main bearings, cylinder walls and crankcase.

This engine is fitted with the new Peerless reverse gear, the design of which has been changed so as to allow the gears to run in a constant bath of oil. The oil is contained in the crankcase instead of the revolving gear drum. The housing covering the reverse gear is oil-tight, making the engine very clean. This cover is fitted with a large hand plate which can be easily removed for adjustment and lubrication.

In addition to the new Peerless Twenty-five there is exhibited a full line of the standard engines. This consists of a 20-30 h.p. and 20-24 h.p. heavy-duty model, the 25-35 h.p., 16-20 h.p., 12-16 h.p. and 8-10 h.p. medium-duty and the speed models. The Peerless line is shown in space G, near the main entrance.

A full line of the motors manufactured by the Gray Motor Co., of Detroit, Mich., is being shown this year. One of the prominent features of this line is the new Model D-Jr., which is shown in two-cylinder and four-cylinder sizes. The D-Jr. has a bore of 3 inches and a stroke of 4 inches, and in the respective sizes develops 5-6 h.p. and 10-12 h.p. The crankshaft is  $2\frac{1}{4}$  inches in diameter and is accessible through large handhold plates on both sides of the crankcase. The motor is marked by generous bearings, large valves and the latest engineering practice in every detail. The Model D, which was first shown last year, is also on hand and like the D-Jr., it can be purchased with no equipment whatever and is furnished with any other equipment which the customer may desire. The Model D has a bore and stroke of  $3\frac{1}{2}$  x  $4\frac{1}{2}$  inches and the cylinders are cast two en bloc. The camshaft, pump and magneto drives are through silent chain instead of gears. This mechanism is enclosed in an oil-tight housing and, of course, the valve tappets are likewise enclosed. The Model D can be had with either aluminum or iron base.

The four-cylinder four-cycle Model G is shown equipped with mahogany instrument board which carries all controls. This control board which permits a simple and compact installation has been strictly a Gray feature. This engine is designed for medium-duty service and it is rated at 30 h.p. with a bore and stroke of  $4\frac{1}{2}$  x  $5\frac{1}{2}$  inches. The six-cylinder Model C is built along the same general lines as the four-cylinder motor except that the cylinders are cast in blocks of three. This motor with a bore and stroke of  $3\frac{1}{2}$  x  $5\frac{1}{2}$  inches is rated at 40-50 h.p., and is considered to be one of the finest jobs that ever left the Gray factory. The complete line of Gray two-cycles includes the famous Gray Gearless detachable motor. The two-cycle models shown are as follows: The 3 h.p. single-cylinder Model U, the  $5\frac{1}{2}$  h.p. single-cylinder U, the 6 h.p. two-cylinder U, the 11 h.p. U arranged as a unit power plant, the Baby Grand and the Gray Gearless.

The Mason Machine Works, of Taunton, Mass., is exhibiting its complete new line of marine engines, together with a 30-foot mahogany runabout built by Geo. Lawley & Sons Corp., of Neponset, Mass. This boat is constructed and finished in the usual Lawley manner, and it is equipped with a Mason four-cylinder 75 h.p. model B motor having a bore and stroke of  $4\frac{1}{2}$  x 6 inches. As equipped the boat shows a speed of about 25 m.p.h. and she is declared to be exceedingly able and seaworthy.

The new line of Mason engines consists of the following: The four-cylinder B referred to above, the Model D having  $5\frac{1}{2}$  x 7-inch bore and stroke and four, six and eight cylinders delivering 50, 140 and 200 h.p., respectively. These motors have the cylinders cast two en bloc with the heads integral. The third, Model G, is built in four and six cylinder ratings at 80 and 125 h.p. each and has cylinder dimensions of  $6\frac{1}{2}$  x 9 inches. From this it will be observed that the Mason Company is building engine of three cylinder sizes and they are suitable for boats of from 30 to 125 feet in length. The B type is built for high-speed runabouts and day cruisers, the D type for heavy high-speed work and the G type is suitable for heavy-duty work.

Features of these motors include the enclosure of all moving parts, the absence of water and oil piping, flanges, gaskets, etc. The materials used in their construction are of the very best, the crankshafts and connecting rods being drop forgings and the bearings in the form of bronze boxes rifled and tinned with the babbit put in under pressure and thoroughly peened before scraping. The upper crankcases are of bronze and the lower bases or oil pans are of aluminum excepting in type G in which both the upper and lower crankcase is of semi-steel. The oiling system is of the pressure type, the oil being pumped to every part which requires lubrication, including the reverse clutch, thrust bearings, etc. All lubricating oil is cooled by the circulating water and is filtered for re-use. In connection with this pressure system the makers have provided a splash system. The auxiliary tank is located just aft of the cylinders and in this way a constant level of oil is provided in the oil pit. Bosch ignition is used. Leccé-Neville starters may be furnished when desired and the equipment throughout is of the best.

The direct results from the 1915 show were so satisfactory to the Mianus Motor Works, of Stamford, Conn., that this concern has taken over twice as much space as it occupied last year at the Garden. While the greater part of this space will be taken up by the two-cycle line of Mianus engines, there are exhibited in addition to these several new four-cycle models. These include an overhead valve motor in 12, 18 and 24 h.p. sizes, which are being built to sell at a moderate price. While these motors are not fitted with all the expensive accessories which are included at the one price in the more expensive line of Mianus four-cycle motors, it is declared that they will be just as well built, just as powerful for the bore and stroke and just as efficient.

All Mianus four-cycle motors are so constructed that either the make and break or jump spark ignition may be left off if desired, so that any system of ignition is available. A small but very important improvement in the mechanism of the make and break models for 1916 lies in the new spark points that have recently been adopted. These have been designed to do away with all brazed or welded joints inside the cylinders and are declared already to have proven their merits.

The complete exhibit of Mianus motors at the Palace is as follows: 1½, 3, 5, 7½ and 10 h.p. single-cylinder, two-cycle motors with make and break ignition; 6, 10, 15 and 20 h.p. double-cylinder sizes of the same type; a 6 h.p. single-cylinder, two-

cycle machine with jump spark ignition, and a double-cylinder engine of twice the power; a 12 h.p. two-cylinder four-cycle motor with make and break ignition, and a 16 h.p. two-cylinder, four-cycle with both make and break and jump spark ignition; a 24 h.p. three-cylinder and a 32 h.p. four-cylinder motor, also with the two types of ignition.

In addition there is shown a novelty in a small light skiff motor capable of developing from 14 to 2½ h.p. This motor should prove of decided interest, as it is stated to be the first practical machine of its kind to be furnished with make and break ignition.

The Lamb Engine Co., of Clinton, Ia., is exhibiting this year in space F 1 and 2, and F. B. King, of the New York office, is in charge with Messrs. Wetherald, Roland, Cool and Donnelly assisting. Altogether five separate models are shown and of these the four-cylinder Model R is most featured. This motor is rated at 24 h.p. and with  $5\frac{1}{2}$  x 6-inch cylinders develops its power at a normal speed of 500 r.p.m. The motor is particularly accessible as to its moving parts and it is equipped with duplicate ignition, reverse gear, mechanical force feed direct lubrication, carburetor and air compressor. The Model G Lambkin, the high-speed runabout motor, is shown in both sizes—four and six cylinders, developing 20-30 and 35-50 h.p. respectively. There is also a six-cylinder model H heavy-duty motor with  $6\frac{1}{2}$  x 7-inch cylinders. This motor weighs 2,000 pounds and develops its rated 60 h.p. at 450 r.p.m. The sixth motor on exhibit is the two-cylinder model F which is designed for medium heavy-duty work and is rated at 15 h.p.

The Scripps Motor Co., of Detroit, Mich., and the Winton Engine Works, of Cleveland, O., are combining their exhibits at this year's show. The Winton Co. has confined its display to one model W6 marine motor and two generator sets. The W6 is an 80 h.p. engine with  $6\frac{1}{2}$  x 9-inch bore and stroke and a rotative speed of 450 r.p.m. The two generator sets shown are the well-known models W7 and W2. Both are direct-connected gasoline electric sets. The W2 is rated at 5 K. W. and the other at 3 K. W. Both have engines of the same cylinder dimensions, but the speed at which they turn differs.

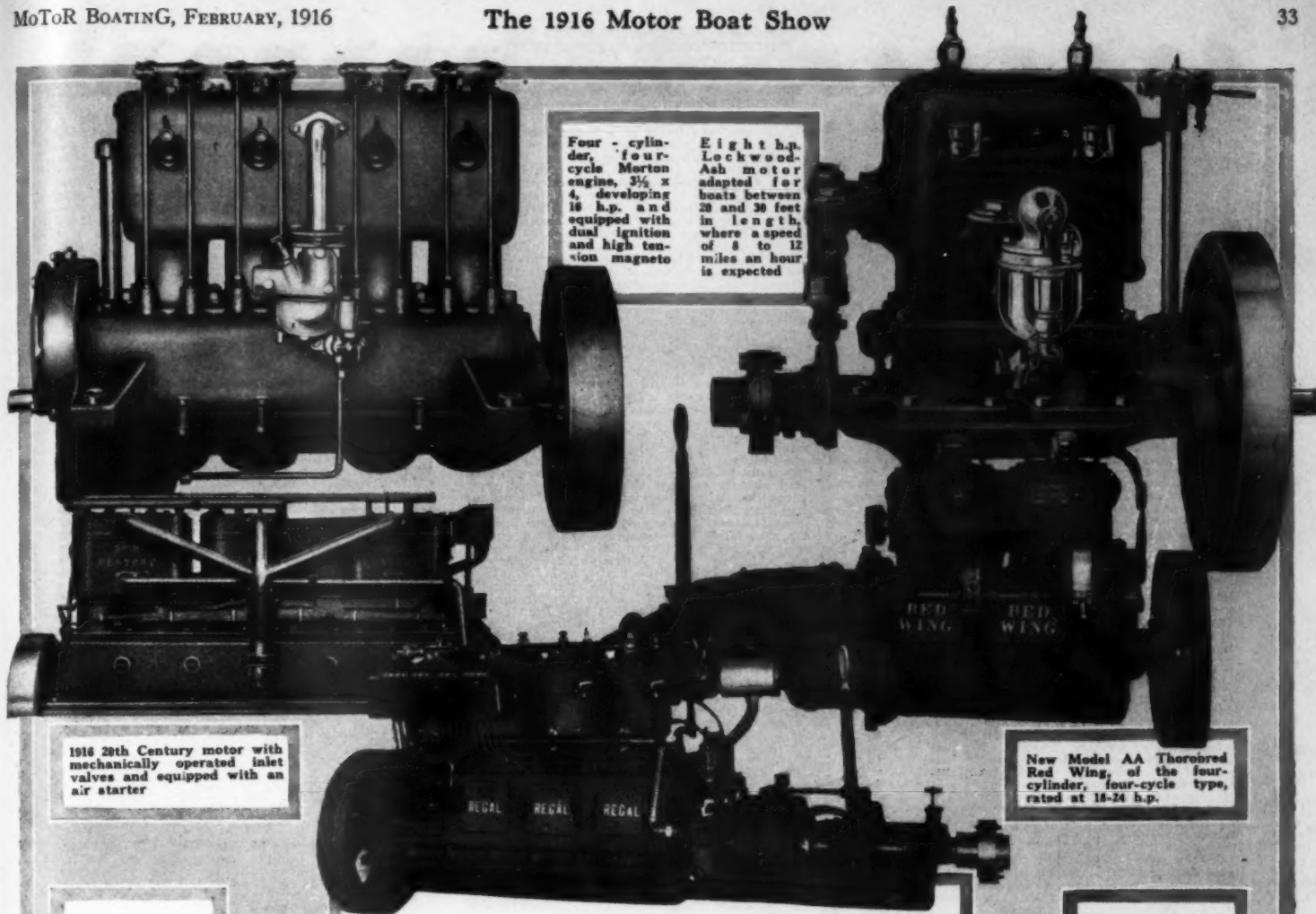
The Scripps Co. has on display its two-cylinder, four-cylinder and six-cylinder series B marine motors. No new engines are being brought out by this concern for the 1916 trade, but many improvements have been effected over the old models. The headliner in the Scripps family is the four-cylinder model HB which is declared to have met with a great demand during the last season. All of these series B motors have  $4\frac{1}{2}$  x 5-inch cylinders and the various models differ only as to the number of cylinders.

The Arrow Motor & Machine Co., of 30 Church Street, New York, is showing for the first time the new Arrow outboard motor in both one-cylinder and two-cylinder types. The Arrow two-cylinder engine is one which has been experimented with by expert engineers until the manufacturers can now offer a power plant which develops 4 h.p. and operates for four or five hours on a gallon and a half of gasoline. This motor is exceedingly compact and weighs only about 70 pounds. It is equipped with high class accessories including Bosch magneto, spark plugs, reversible propeller, etc. The instantaneous bracket clamp with which it is fitted permits it to be fastened to the boat with a hand lever instead of winged screws. It is declared that this motor is sufficiently powerful to drive an ordinary rowboat at a rate of from ten to fourteen m.p.m.

The Electric Tachometer Co., of the Ferry Bldg., Philadelphia, Pa., is exhibiting this year a new averaging tachometer which will read on one indicator the speeds of each of the two individual shafts of a twin-screw vessel, or the average speed of the two shafts in combination. This equipment was first built for testing purposes for one of the leading shipyards of the country and it has given such satisfaction that the manufacturers are putting it on the market for general motor boat use. As shown in the illustration this tachometer is fitted with a more or less elaborate equipment, especially with regard to the gear drives. For motor boat work, however, it will not be necessary to go into this extensive detail. As exhibited at the Palace, the averaging tachometer is shown in operation as adapted for motor boat work. It is declared that the average speed is given most accurately and by the simple throwing of a switch it will indicate the individual speed of either shaft with the same accuracy. Standard model tachometers are also shown in four types together with this company's portable precision tachometer with triple scales.

The Niagara Motor Boat Co., of North Tonawanda, N. Y., is displaying one of its high class runabouts equipped with a Fay & Bowen four-cycle motor. Niagara runabouts are distinctive because of their style and finish. They are put out in various lengths of which a 32x6-foot size equipped with a 30-45 h.p. motor is particularly attractive. In this model the decks and interior are finished in mahogany, and the seats are of the bucket type with deep box springs and genuine Spanish leather upholstery. The boat is equipped with an electric starter, electric lights and pedal reverse control. It has a new type of auto top which is fastened to the brass rail along side of the coaming upon which it easily slides back when the owner wishes to fold it down on the after deck. The after flag pole has an electric light of Gray-Hawley type at the top.





Four - cylinder, four-cycle Morton engine,  $3\frac{1}{2}$  x 4, developing 16 h.p. and equipped with dual ignition and high tension magneto

Eight h.p. Lockwood-Ash motor adapted for boats between 20 and 30 feet in length, where a speed of 8 to 12 miles an hour is expected

1916 20th Century motor with mechanically operated inlet valves and equipped with an air starter

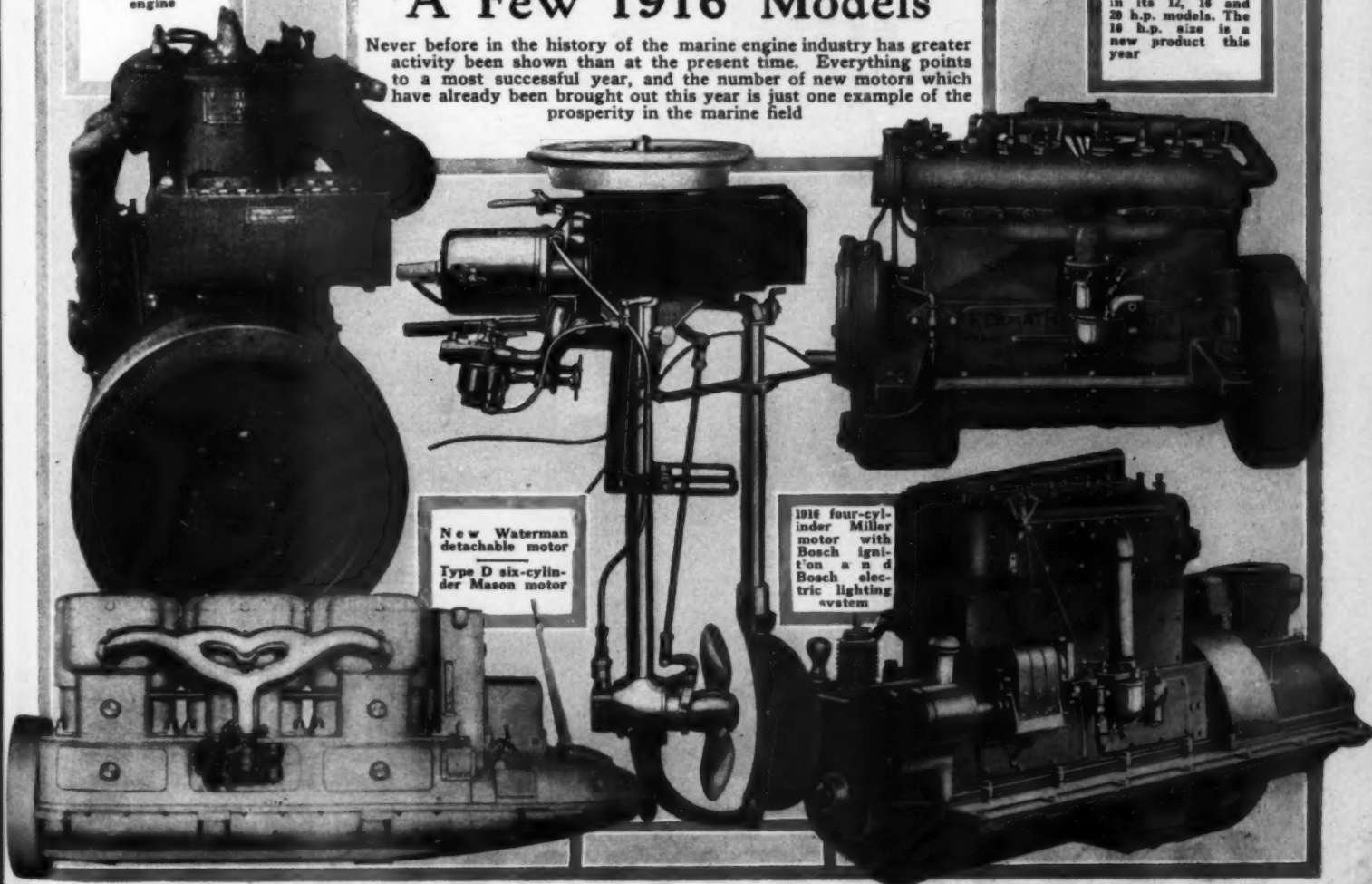
New Model AA Thorobred Red Wing, of the four-cylinder, four-cycle type, rated at 18-24 h.p.

Latest 5x8-in. Anderson engine

## A Few 1916 Models

Never before in the history of the marine engine industry has greater activity been shown than at the present time. Everything points to a most successful year, and the number of new motors which have already been brought out this year is just one example of the prosperity in the marine field

The Kermath Mfg. Co. now has three unit power plants in its 12, 16 and 20 h.p. models. The 16 h.p. size is a new product this year



New Waterman detachable motor  
Type D six-cylinder Mason motor

1916 four-cylinder Miller motor with Bosch ignition and Bosch electric lighting system

## The 1916 Motor Boat Show

The booth occupied by **Bruns, Kimball & Co.**, of New York and Philadelphia, is one well worth looking at, for it contains representative models from several well-known lines of marine engines. One of these is the improved Kermath motor, which is built in three sizes—12, 16 and 20 h.p. The newest of these is the 16 h.p. model, which was announced only a month or so ago. This is the serviceable unit power plant designed for the small runabout or hydroplane or the cruiser. One of the chief features of the Kermath motor is the oiling system, which is simple and positive. An oil pump of the plunger type driven from the camshaft takes the lubricant from a reservoir and carries it to the forward end of the engine, filling every oil trough to the required level and maintaining that level at all times. There are no oiling cups nor grease cups to bother with, and a float gauge shows the operator at all times the amount of oil in the reservoir.

In addition to this line the four-cylinder, four-cycle 9-12 h.p. Herrmann Small Aristocrat is also shown. This motor is now built with  $2\frac{1}{4}$  x 4-inch cylinder dimensions and it is equipped with water-jacketed exhaust header, high tension magneto, enclosed reverse gear, etc. The bearings, crankshaft, etc., are of ample size and this motor is declared to have been giving splendid satisfaction for two seasons in several boats in New York waters. It is used in high-class tenders and also in fast runabouts and hydroplanes. Bruns-Kimball are showing as well a detachable rowboat motor having two horizontal opposed cylinders. This motor is of the four-cycle type and is declared to have refinements and improvements which put it in a class by itself.

The Baldrige reverse gear of enclosed type is likewise on display. These are balanced planetary gears with a single shaft which is supported at the ends by long bearings, eliminating the possibility of sagging, heating or grinding. The latest models have detachable tubular levers, which can be bent or shaped for special installation. In addition, if it arrives in time, there will be one of the Missouri oil engines of the semi-Diesel type. This engine is not equipped with any carburetor and is fitted with a quick-starting tube by which it can be got under way in a very short time. It is provided with a suitable water injection pump for the elimination of carbon deposits. No fuel is taken in the base—nothing but clean air entering this part of the engine—and the oil is not injected until the piston has nearly reached the top of the stroke. Representatives of Bruns, Kimball & Co. will also be found at the exhibit of the Sterling Engine Co., as the Sterling is handled by them in this territory.

In the space occupied by the **Fay & Bowen Engine Co.**, of Geneva, N. Y., will be found this year two very attractive runabouts, as well as several Fay & Bowen motors in both two and four-cycle

types. One of the boats is a brand new product, a 30-footer with  $5\frac{1}{2}$ -foot beam which has been designed for this company especially by Morris M. Whitaker, of Nyack, N. Y. The planking is of southern white cedar, and the top and interior are in full mahogany. A 30 h.p. four-cycle six-cylinder Fay & Bowen motor with electric starter is installed and the equipment includes electric lights, divided driver's seat, full upholstery, etc. The other boat is a 25-footer, which, while not exactly new, has been recently modified and improved. The accompanying photograph shows this runabout in its earlier form, but no pictures have been taken of it since the improvements were effected. This boat is similar in construction to the 30-footer, but it is equipped with a 22 h.p. motor, which is, of course, of Fay & Bowen make. The boat equipment includes electric starter and lights, automobile top, upholstery, etc. The engine display comprises four-cycle engines in different sizes, including the well-known Big Six motor, a Fay & Bowen two-cylinder two-cycle machine complete with reverse gear and one combination lighting and pumping set for large yachts.

Prominent in the exhibit of **Fairbanks, Morse & Co.**, of Chicago, Ill., is the type CO marine engine of the semi-Diesel type. This is a new design effected with the primary thought of reduced operation, together with a special consideration of durability and reliability. The type CO is turned out in several sizes for heavy-duty work and operates with a moderately high compression. They embody several features peculiar to this make of engine, among which are the following: The combustion chamber is entirely without the cylinder. There is no water injection used in the cylinder and this is claimed to be of special advantage for cruising on the high seas. Special means have been devised to automatically seal the crankcase from the bearings, this construction eliminating the necessity of packing glands and consequently preventing any lubricating oil from being blown out. These engines are designed to run on the lower grades of distillate and on fuel oils, and it is declared that in some sections where crude oil is available, they are operating successfully on this. One boat which the company mentions as using this grade of fuel is the 65-foot Amazon with a 45 h.p. motor, which makes the round trip between Seattle and Tacoma daily at a cost of fuel and lubricating oil of 46 cents. Another freighter, Panama, makes the 120-mile trip between Long Beach and San Diego, Cal., at a cost of \$2.40 for lubrication and fuel.

In space A-6 at the Palace, the **Frisbie Motor Co.**, of Middletown, Conn., is exhibiting representative models of its line as well as a metallic motor lifeboat equipped with one of its motors. Taking them up in order, the smallest motor shown is a single-cylinder 5-7 h.p., 6 x 6-inch machine equipped with Paragon reverse gear and Frisbie kerosene con-

verter. The next larger size is a two-cylinder motor having the same cylinder specifications which is rated at 12 to 16 h.p.; this engine is lubricated by the splash system and is fitted with reverse gear, bilge pump and oil pump. A three-cylinder motor, which is also shown, develops 18-25 h.p., and in addition to the splash lubricating system is equipped with a mechanical oiler. Four-cylinder and six-cylinder motors rated at 30-40 h.p. and 50-75 h.p., respectively, of the same general design as the three motors just mentioned are displayed, and these motors are very completely equipped with air compressors, oil return pumps, bilge pumps and Bosch magnetos. The sixth motor shown is a 20-30 h.p., 4 $\frac{1}{2}$  x 5-inch machine with full equipment. Paragon reverse gears are provided with all motors. The lifeboat mentioned above is a 26-footer with 7 feet 9 inches beam, having a capacity for thirty-six persons which is manufactured by the C. M. Lane Life Boat Co., of 245 Huron street, Brooklyn, N. Y. Messrs. B. F. Brown, R. A. Frisbie, K. W. Dyer and H. E. Holmes are in charge of the Frisbie space.

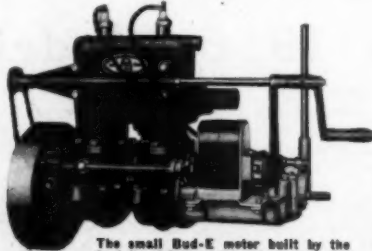
The **Caille Perfection Motor Co.**, of Detroit, Mich., is not exhibiting this year under its own name, but it has made arrangements with the **E. J. Willis Co.**, of New York to display one of the new Caille Five-Speed outboard motors. This motor has been fitted with several devices during the past year or two which are designed to improve its reliability and easy running qualities. The most recent, and what is considered by some the most important, however, is the self-starting apparatus which was announced in the January issue of this magazine. The self-starter is a mechanical fitting attached to the top of the flywheel, and with it the motor may be cranked without any danger of back-kick. It consists of a drum-like enclosure of trifling weight within which there is a simple coil and ratchet which engages the shaft of the motor. The operator merely takes hold of a small handle, gives a sharp pull and the flywheel revolves rapidly without a touch of the hand. It is stated that a pull of not more than a few pounds' weight is required to operate the device. One convenient feature of this self-starter is that a line may be attached to it and led to any part of the boat, thereby making it unnecessary for the operator to go aloft to the motor when he desires to get under way.

There is also a new water-proof magneto in this year's Caille Portable, and this instrument is of positive water-proof, damp-resisting quality, and generates a hot spark, which is warranted to unit the fuel under the most trying conditions.

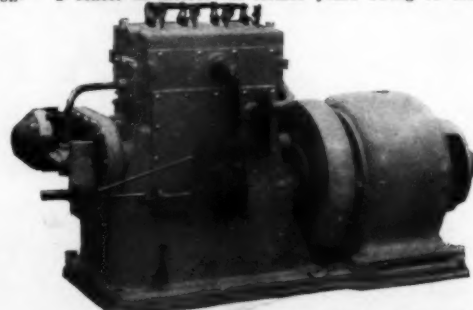
The **Carlisle Johnson Machine Co.**, of Manchester, Conn., has an attractive display this year of its Bud-E marine motors and its model F Johnson reverse gear. This company's booth has always been a center of interest in former years owing to the



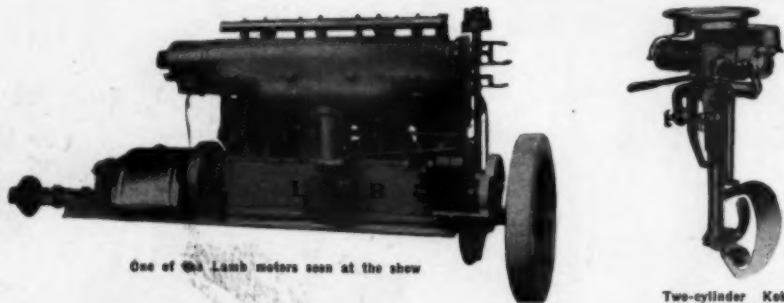
Palmer Bros., of Cos. Gen. Cons., are showing thirty-five models from 2 to 30 h.p. of the two and four-cycle type



The small Bud-E motor built by the Carlisle Johnson Machine Co., of Manchester, Conn. Although small in size, this motor lacks none of the refinements found on the highest grade marine motors of today



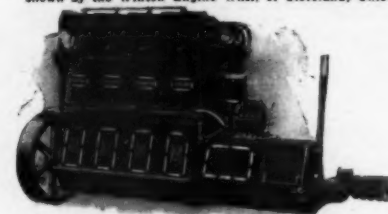
One of the well-known Winton gasoline-electric generating sets shown by the Winton Engine Wks., of Cleveland, Ohio



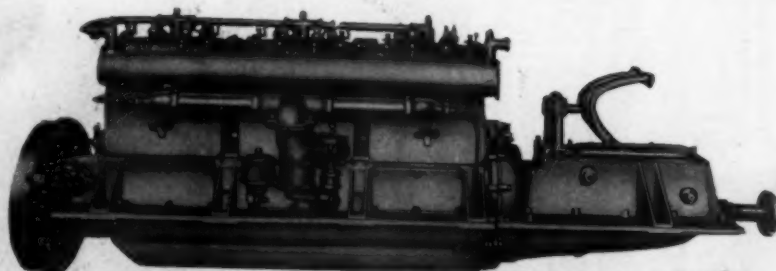
One of the Lamb motors seen at the show



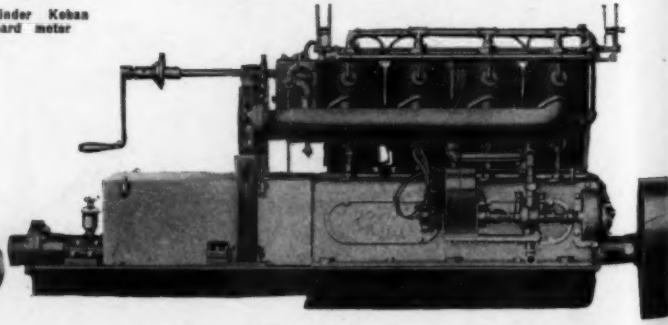
Two-cylinder Kohan outboard motor



Heavy-duty Fairbanks-Morse motor, which line includes motors designed to run on kerosene, gasoline or heavy oil



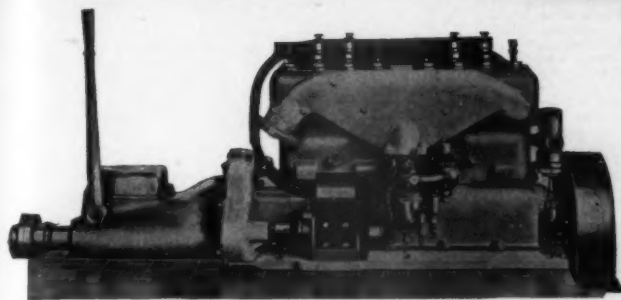
Six-cylinder Elco motor with pedal reverse control used in the 38-foot Elco express runabouts



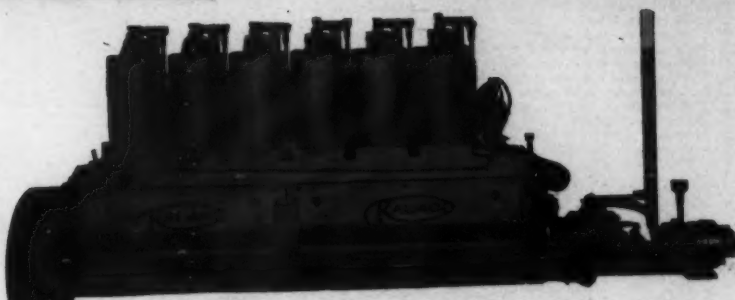
One of the four-cylinder Dorman motors at the show



# The 1916 Motor Boat Show



Callie 14 h.p. Aristocrat for high-class runabouts. Fitted with electric starter and many other features



One of the Ralston motors shown by the S. H. Jones Co., of Toledo, O., which shows several new features this year

undoubted beauty of the little Bud-E tender motors. They are shown enameled and polished to a degree, and they certainly seem to spell efficiency in every detail. Both motors are of the three-port, two-cycle type and are shown fitted with jump spark ignition and high tension magnetos. The smaller model, which is rated at 5 h.p., has 3 x 3-inch cylinders and develops its power at a speed of 1,200 r.p.m.; the larger motor at the same speed develops 15 h.p. from its 4 1/4 x 4-inch cylinders. Both are two-cylinder machines.

The model F reverse gears are of the enclosed type and are capable of carrying any horsepower up to 50 or 60. These gears are of ball bearing type, permitting, it is stated, the transmission of more of the actual power of the motor than is possible with any other type. The gears are easy to lubricate and adjust, while the enclosed design renders any spattering of oil impossible.

The Evinrude Motor Co., of Milwaukee, Wis., has always taken special pains to make its display at the New York show attractive and what with velvet draperies and pretty sales girls, this concern's popular outboard motors have always been shown to the best advantage. This year will prove no exception to the rule, and in fact, the Evinrude people have been saving for the Palace Show, what is perhaps the most important feature that they have ever introduced—a two-cylinder four-cycle detachable rowboat motor. The Evinrude has heretofore been obtainable only in single-cylinder form; but as the use of outboard motors spread, and boat builders began to design hulls especially for this type of motor, there has sprung up a demand for a more powerful and speedier engine. In the new motor the opposed cylinder construction is combined with the well-known efficiency of the four-cycle principle, the result being, it is said, a remarkable motor with great speed, increased power and freedom from vibration. The starting is easy, the motor picks up quickly and the control of its speed is so effective that it can be throttled down as low as one mile an hour without backfire. The same system of mixing the lubricating oil with the gasoline as is found with the two-cycle Evinrude is employed, this being unusual for four-cycle practice. Extensive experimentation in pistons and piston rings is declared to have brought about an increase in the number of revolutions with a consequent gain in boat speed. The well-known Evin-

rude features, including the automatic reverse and the built-in flywheel are included, and new safeguards and improvements are found on this, as well as the other 1916 models. It should not be thought that the introduction of this motor means the abandonment of the two-cycle motors, as the company believes that there will always be a demand for this type of motor and will display them in its booth as prominently as heretofore.

Prominent in the display of the Automatic Machine Co., of Bridgeport, Conn., are two 1916 model four-cylinder Automatics. This new motor is made in five sizes—30, 40, 50, 70 and 100 h.p.—but only the 30 h.p. models are shown. Several new features are incorporated in the design of these motors which, with the exception of the 30 and 40 h.p. models, are constructed with separate cylinder heads. The lubricating system is enclosed, oiling being taken care of by a large geared force pump arranged to take the oil from a reservoir underneath the bed. The pump is driven direct from the crankshaft gearing, and it delivers a 1/4-inch stream of oil to each connecting rod, and the rods in turn distribute or splash the lubricant over the whole interior of the motor. A speed governor is mounted directly over the camshaft gears and is connected and driven by a pair of spiral gears through a countershaft which drives the magneto. The governor and driving mechanism are entirely enclosed. Magneto equipment on these motors is optional with the purchaser, but in the models exhibited at the show a K-W type H-K instrument is fitted. The buyer may also choose his own carburetor, but the show models are Schebler equipped.

The cylinders are of the L-head type and are exceptionally well proportioned with large water space, cooling the cylinders and the valve seats. The top faces of the cylinders are without cored holes, with the exception of one for the circulating water, and this is outside, so that there is no possibility of water entering the cylinders. In the three models having separable cylinder heads, these parts are cast of the same iron as the cylinders. The cylinder heads are securely held by large studs. All the bearings of these motors are bronze and are removable and adjustable. The upper half of each main bearing is reinforced by a steel plate on to which a cap adjusting screw bears; adjustment is by means of an extra large octagonal head

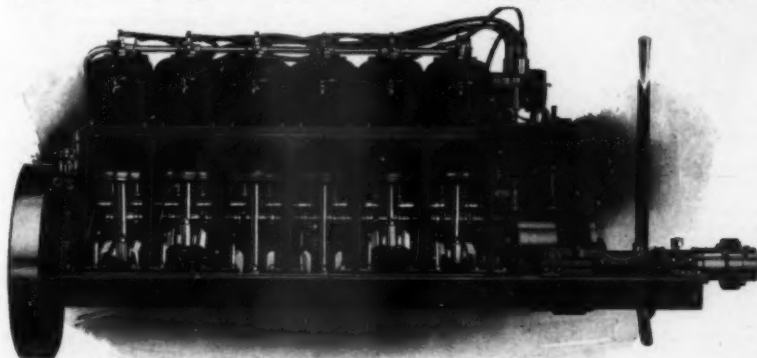
screw with a keeper. Turning this screw adjusts the bearing without loosening the cap, which is thoroughly and permanently fastened in position. The keeper is designed to prevent the screw from working in either direction and is declared to make possible a quick and efficient adjustment.

The cylinder sizes of the various models are as follows: 5 x 7-inch, 30 h.p.; 5 1/2 x 7-inch, 40 h.p.; 6 1/2 x 8-inch, 50 h.p.; 7 1/2 x 9-inch, 70 h.p.; 8 1/2 x 10-inch, 100 h.p. These ratings are figured at a piston speed of 800 r.p.m.

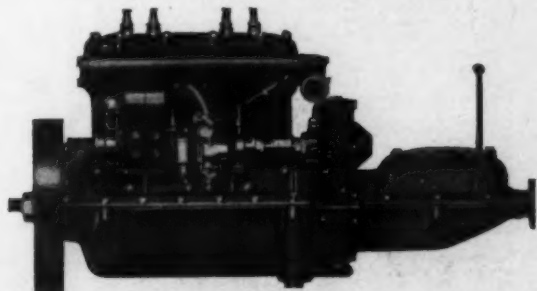
The new J-M fire extinguisher is featured by the H. W. Johns-Manville Co., of New York City, in its exhibit in the annual motor boat show at Grand Central Palace. The Johns-Manville booth is just two spaces to the right from the top of the mezzanine stairway, on the north side of the building. Demonstrators explain and operate the new hand extinguisher every day of the show, at all hours the exhibits are open. In demonstrations it extinguishes gasoline, naphtha and other oil fires, electric arc and such "extra hazardous" flames in from two to twenty seconds. Its new "air compression chamber" makes pumping unnecessary while directing the stream, which permits its more effective use in cramped quarters or awkward positions on a motor boat.

Evans & Skillman, of 137 Liberty street, New York City, who are the new New York sales agents of the Morristown Boat & Engine Wks., of Morristown, N. Y., have taken space at the New York Show and are exhibiting one of the latter's motors. Morristown motors are made in the two-cycle type in four sizes, and in two and three cylinders, the respective models developing 4, 6, 10 and 15 h.p. There is also a 25 h.p. four-cycle motor in the Morristown line which has four 4 1/4 x 5-inch cylinders and develops its rated horsepower at 850 r.p.m.

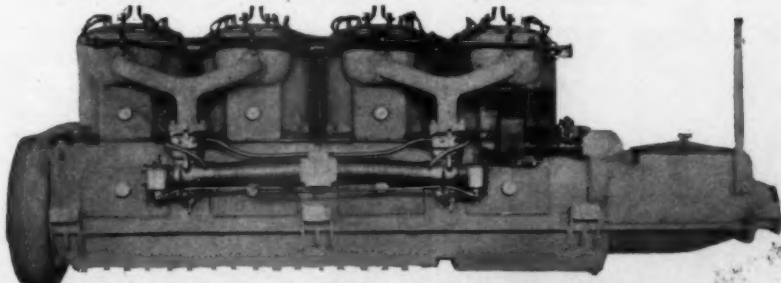
The Ferro Machine & Foundry Wks., of Cleveland, O., is showing representative models from its line of two and four-cycle motors. Last year the new four-cycle Ferro was one of the features of the show and this line has been increased in the meantime to include a very attractive 10 h.p. 2 1/2 x 4-inch four-cylinder motor. This machine is of the all-enclosed type and is noted for its simplicity of construction and the accessibility of its parts. The engine is cast in three pieces, with the result that the effects of vibration are practically unnoticeable. A feature of the new Ferro is the oiling system, a circulating system of splash lubrication being used.



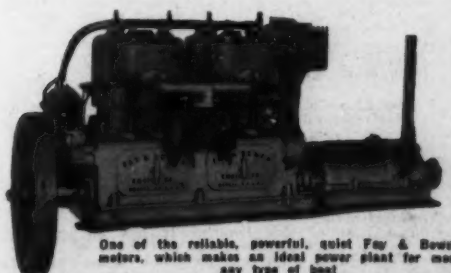
New six-cylinder 60-70 h.p. Campbell motor with side plates removed, showing accessibility



The new Model D Jr. Gray motor, a four-cycle machine with 3 x 4-inch cylinders, which develop 10-12 h.p.



One of the Model F Sterlings, built with four, six and eight cylinders in the 5 1/2 x 6 1/2 and 6 1/2 x 9-inch sizes



One of the reliable, powerful, quiet Fay & Benson motors, which makes an ideal power plant for most any type of boat

One of the most interesting motors in the show is the Lord De Luxe which is being exhibited by Frederick K. Lord in the Loew-Victor booth. This motor was developed under Mr. Lord's direction at the plant of the Simplex-Crane Automobile Co., and is declared to possess many pronounced improvements and refinements. There are four cylinders of  $4\frac{1}{2}$  x 6-inch dimensions cast en bloc from vanadium iron. The motor has been tested to run from 300 to 2,000 r. p. m. but the usual range is between 1,000 and 1,500. It is entirely enclosed to the smallest detail and the auxiliaries are so mounted that they are very accessible, and do not interfere with one another, it being unnecessary to remove one part in order to get at another.

The mounting of the magneto is very neat and compact and enables the wiring to be entirely enclosed. There is a housing on the cylinder head that can be removed in a few seconds, thus exposing the wiring, valve caps and plugs. The magneto housing is also quickly removable, laying bare the whole ignition system. The water circulation is very simple and effective and there is only one short straight pipe on the motor. The pump is mounted in a unique manner, the mounting flange being hollow, and two bolts serve to mount the pump and make the water connection at the same time, thereby eliminating piping. The water passes down to the base which as well as the large bearing at the flywheel is jacketed throughout, and it is then admitted to the cylinders at the exhaust where it is warmed slightly before coming in contact with the cylinders themselves. The oiling system is of the pressure feed type through a hollow crankshaft, and is driven by gear pumps which return the oil to a three-gallon copper tank carried on the bulkhead where it is easily accessible for refilling. The clutch and thrust bearing are also pressure oiled so that no grease or oil cups are necessary.

The flywheel is enclosed in a two-piece casting split in the center line and strongly mounted. The valve casting and handhold plates are quickly removable and in fact all the castings and plates on the motor may be removed in less than a minute's time. The crankshaft has five bearings and is drop-forged from alloyed steel. These bearings are very large and are fitted with bronze shells lined with nickel babbitt. The connecting rods are drop steel forgings machined and very light. The pistons are also light in weight but are well ribbed and are made of high quality cast iron.

The carburetor intake is a straight copper tube so arranged that it can be swung to stand vertically in the boat, and a feature of the motor is the side exhaust. This exhaust is declared to have several advantages, one of them being that the motor may be installed close to the bulkhead without necessitating a right angle connection. The gas passage is very short and the position of the outlet is such that a good easy bend is obtained on the exhaust pipe.

The Gas Engine & Power Co., and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y., are exhibiting on the main floor of the Palace three of their representative motor boats as well as three marine engines and a Speedway alcohol range. Of the boats the largest is a 43-foot V-bottom cruiser equipped with a six-cylinder 60-hp. p. motor. This boat is an excellent example of Seabury design and construction, and is of the bridge-deck type with the power plant installed under the bridge deck. Comfortable seating accommodations for four are provided and a small crew of one or two men may be taken care of in the engine-room. The other two boats shown are both 25 feet in length and are powered with the four-cylinder 22-hp. p. Speedway motor. One of these, however, is a yacht tender, while the other is of the well-known Speedabout design of standardized runabouts. Of the motors shown the smallest is a four-cylinder  $4\frac{1}{2}$  x  $5\frac{1}{2}$ -inch machine developing 46 h. p. at 850 r. p. m. Another motor shown is the six-cylinder 64 x 8 $\frac{1}{2}$ -inch which develops 100-115 h. p. The motor which is being especially featured, however, is a six-cylinder job in the aluminum type has developed 150 h. p. under test at 1,200 r. p. m., and in the iron type h. p. at 600 r. p. m. This is a new motor which will also be built in four and eight-cylinder sizes during the coming season.

The Verrier-Eddy Co., of 354 West 14th St., New York City, is presenting this year the exhibit of Lathrop engines manufactured by the J. W. Lathrop Co., of Mystic, Conn., and is showing a full line of its two and four-cycle motors. The two-cycle engines are built in nine one-cylinder sizes ranging from 3 to 12 h. p., in eight two-cylinder sizes having a power range of from 8 to 24 h. p., and in three-cylinder models in 18, 24 and 36 h. p. All of the one and two-cylinder machines may be equipped with either make and break or jump spark ignition, and the three-cylinder models are regularly supplied in the jump spark type. Four-cycle Lathrop engines are turned out in two, three and four-cylinder sizes, ranging in power from 12 to 32 h. p. These are in two different cylinder sizes, the 12, 18 and 24 h. p. models in two, three and four cylinders, respectively, having a bore and stroke of 5 $\frac{1}{2}$  x 6 $\frac{1}{2}$  inches and the 16, 24 and 32 h. p. models having cylinder dimensions of 5 $\frac{1}{2}$  x 8 inches. All of these engines are of the T-head type of valve construction and all are constructed to operate on jump spark ignition.

The Elco Co., of Bayonne, N. J., is showing a Cruisette similar to the one shown last year with the exception that it is powered with a four-cylinder Lamb motor instead of the three-cylinder machine which was installed last year. This Cruisette model is a 32-footer which was designed by the Elco Company for quantity production, and it offers many conveniences and comfort-giving devices which are rarely found on a boat of this length. It has an extreme beam of 8 feet 6 inches, and sleeping accommodations for nine people can be found by making use of the cockpit. The 30-foot express runabout which has been such a feature of the Elco exhibits for many years is again shown with many improvements. This boat is fitted with a 75 h. p. Elco motor. A third boat on display is the 36-foot Express. This runabout is designed for high-speed service and is equipped with a 100 h. p. six-cylinder Elco motor. It is provided with an aluminum cowl of special design arranged to house the running



Electric averaging revolution counter shown by the Electric Tachometer Co.

Gray-Hawley hollow stern shaft with range light exhibited by Charles E. Miller

One of the Splitdorf-Apelco starting motors shown by the Splitdorf Electrical Co.

Pyrene fire extinguisher approved by the board of steamboat inspectors

One of the spark coils manufactured by the Heinze Electric Co.

lights, and the general equipment including the electric lighting and starting system is of the finest throughout.

As usual, the Toppin Boat Mfg. Co., of Boston, Mass., is making a fine display of its boats, which are of special design for rough weather use. This company makes a line of smooth-planked dories in lengths from 18 to 30 feet which are of beautiful finish, and for those not wanting something quite so expensive, there are the famous fishing dories in the same length range, which are not quite so elaborately finished in the interior. The Toppin 20 and 22-foot dories are also very popular, especially for outside fishing and where rough water qualities are needed. One boat in particular which is expected to attract a great deal of attention at the show is the 18-foot dory equipped with a 3 h. p. special reversible motor. This boat has a beautiful finish, the decks being of selected clear pine rubbed and finished with Valpar, and the equipment is in polished brass. It is also equipped with an auxiliary spritsail, and the Toppin company can equip any of its dory launches or fishing dories with this sail at a slight increase in cost.

Another handsome boat exhibited by this company is its famous 22-foot Government Model launch which has been adopted by the U. S. Bureau of Fisheries. This boat is mahogany finished and is equipped with the latest Hall auto steerer with bulkhead control, mahogany hatches, cushions and wicker chairs. Another popular boat is the 17-foot regular Swampscott sailing dory, and a fourth boat on exhibit is this company's famous wide stern outboard motor skiff, made especially for use with an outboard motor. This boat is 15 feet in length and it combines strength and good easy lines, so that while intended particularly for the detachable motor, it can also be rowed easily. It has a good bilge forward and high sides which tend to throw off the water and make it especially adaptable for rough water. This boat which, it is declared, will not settle in the stern, is sold for \$50, with painted finish. A combination price with the Waterman motor can be given and the boat is exhibited with one of these diminutive power plants.

One of the most unusual exhibits that has ever been displayed at a motor boat show is that occupying the space of the Luders Marine Construction Co., of Stamford, Conn., consisting of a 60-foot high-speed cruiser with a beam of 10 $\frac{1}{2}$  feet and 4-foot draft. This vessel in general follows the design that has been developed by this concern, and in this particular boat it has been possible to obtain accommodations for four persons, exclusive of the crew, and a speed of over 18 m.p.h. The owner's quarters are located under the after trunk cabin and consist of a stateroom with two three-quarter width berths, a toilet and a main saloon. This saloon has a wide extension sofa on one side, and on the opposite side a buffet and a folding Pullman berth. Six or eight places may be set at the mahogany dining table. Forward of the saloon and extending right across the ship is the galley which is equipped with an alcohol range, icebox and all the usual appointments. The general finish of the owner's cabin is in white enamel with mahogany trimming and furniture.

The forward part of the boat under the raised forecabin and turtle deck is given over to the crew and engine-room. The engine, one of the new six-cylinder Harbeck's, complete with electric lighting outfit, is set a few feet forward of amidships with the gasoline tanks located immediately aft and under the bridge deck, at which all controls for handling the motor are located. The arrangement plan of this 60-footer is shown in one of the accompanying illustrations.

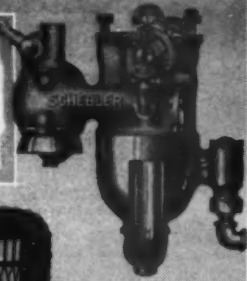
The exhibit of Chas. D. Durkee, of a South street, New York City, looks more like the ground floor of a busy store than it does like a display in a motor boat show. It occupies 800 square feet of space and contains almost enough equipment to furnish a motor boat from stern to stern. One of the leading items in the Durkee line this year is the Dunn Divinhood, which is claimed to be of particular use to motor boat owners. It may be slipped over the head without any trouble, and it is declared that the wearer may go down in 30 feet of water or do repairs to the stuffing box without the slightest inconvenience. Another item which is being brought forward this year and which is on display is the Durkee alcohol stove. One, two and three-burner stoves are now offered in this line with both detached and attached alcohol containers. The Crescent yacht range fitted with plate warmer and auxiliary burner with copper tank for boiling water is Durkee's newest product for larger craft. This range is just over 4 feet high by 2 feet approximately 3 feet, and it is declared to be all that one could desire in effectiveness at a moderate cost. The Durkee automatic fog bell and whistle attachment which consists of a clock with electric connection for ringing the bell or fog whistle is also being shown. Among the other items to mention only a few—are the Universal Crescent clamp, Pathfinder compass, fog horns, bells, etc.

The display of Chas. H. Gillespie & Sons, of Jersey City, N. J., is along lines similar to those adopted by this company for its exhibits of other years. Gillespie's Monarch spar varnish and Bull Dog paint and varnish remover are the two features of this company's line which are most prominently displayed. Monarch spar varnish is a preparation which is used by professional and amateur mariners. It is stated to be proof against sun, rain and salt water, and the Bull Dog remover, as its name implies, is a preparation for use before repainting any wood or metal surface. It is a slow-drying, quick-acting composition which is declared to be much more effective than the burning off method. Monolac is another Gillespie preparation intended especially for the interior woodwork of motor boats, and Monarch engine enamel is declared to be excellent in brightening up old engines. This company's booth is in charge of C. H. Gatchell with a corps of salesmen constantly in attendance to take care of all interested visitors.

The firm of Berry Bros., of Detroit, Mich., manufacturers of varnish and shellac, bleachers and refiners of wood alcohol, is exhibiting at the Palace in space No. 24, which is located on the mezzanine floor. This exhibit is made up mostly of finished wood panels which show to good effect the qualities of Berry Bros. products. There are also



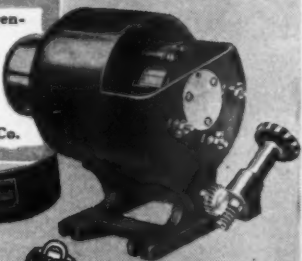
Type L Schebler carburetor designed especially for controlling range in speed



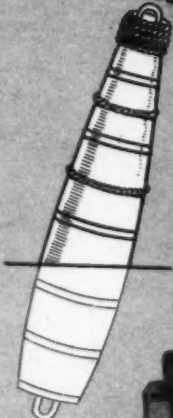
A Wicker-Kraft chair manufactured by the Wicker-Kraft Co. of Newburgh, as shown in several boats



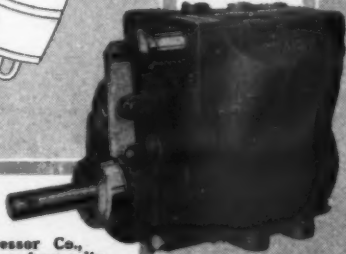
Apelco generator for motor boats, shown by the Apple Electric Co.



Holospar buoy shown by the Holospar Cooperation Co.

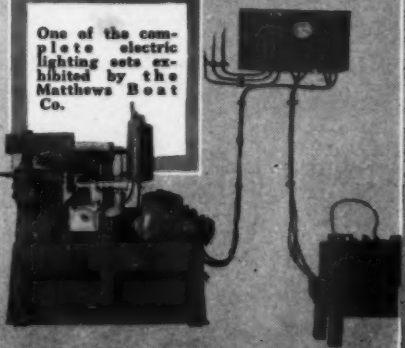


The "Perfect" air starter, manufactured by the Motor Com-



pressor Co., is a four-cylinder, V-type contrivance

One of the complete electric lighting sets exhibited by the Matthews Boat Co.



several large glass jars filled with water—some with salt water, some fresh and some muddy. In these jars are placed panels which have been finished with this concern's Luxeberry spar varnish. The idea of this novel exhibit is, of course, to demonstrate the water-proof qualities of Luxeberry spar when used on boats whether running in salt or fresh water.

The A. S. Campbell Co., of Boston, Mass., is making a special feature at the show this year of its Cello electric running lights. At the time of the New York Show last year the Campbell Co. was just developing this line. Now it has been perfected, making, it is stated, one of the best sets of electric running lights on the market. A large amount of business is expected on this particular line, both during the New York Show and throughout the season. These lights are so designed that they may be installed on any oil lamp already in place on a boat, and the lamp adapter which is substituted for the regular oil burner does not disable the oil system. The adapter is adjustable to any height to obtain a proper focus of the light. Five ordinary dry cells will operate this outfit successfully, or it may be connected with a dynamo or storage battery. The complete equipment for one lamp with deck socket connector plug, 6-volt tungsten bulb, 6 feet of cord, etc., is sold for \$3. Other articles of the Cello line which are on display are the No. 10 Star searchlight, the No. 10 Wire-Less searchlight and various other electrical devices.

The Columbian Brass Foundry, of Freeport, L. I., is on hand at the Palace this year with a very complete display of its various products. Among the most prominent features are the racks of Columbian propellers which are made in a great variety of styles, and there is also a full line of rudders, rudder accessories, universal struts, etc. The Columbian pedal reverse control, which is shown fitted for operation, is an item of the exhibit which is sure to attract universal attention. The trend in runabout design these days is to minimize manual labor and centralize the entire control of the boat. With this outfit installed it is possible for the operator to have complete control of the movement of his craft without taking his hands from the steering wheel. Such a device as this minimizes the danger of stalling the motor when making a quick reverse, as the helmsmen may have the spark and throttle controls constantly under his fingers.

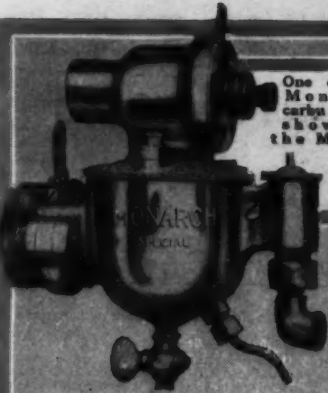
The exhibit of the Brooklyn Varnish Mfg. Co., of 35 Nostrand avenue, Brooklyn, N. Y., is one which will be sure to attract many visitors, as there are incorporated in it several attention-compelling devices. One of these is a massive aquarium containing many rare specimens of gold fish. Another device gives the effect of the transformation of a jar of real gold fish into a can of Kauri waterproof varnish before one's eyes, and this will prove perplexing if not mystifying to a great many. Of course, the real object of this exhibit is to display Kauri varnish to the best advantage, and there are several devices included to suggest the durability of this product, its light color, its elasticity and its quick drying qualities. Kauri is described as a water-proof varnish which defies the evils of salt and fresh water. It is made from Kauri gum and is almost water white in color. It is declared to work easily and to dry hard over night, although it does not skin or thicken in the can. It is intended for inside or outside use and is sold for \$3 per gallon.

The Cape Cod Power Dory Co., of Wareham, Mass., is on hand at this year's show with a very complete exhibit. This company occupies block A-5 on the main floor—a space which is very well suited to display effectively its line of dory type boats. One of the most attractive of the boats exhibited is that shown in the illustration on page 31—a special 20-foot dory launch, having the motor housed in an after cabin. Another model which is sure to attract interest is a 17-foot launch with 4-foot 10-inch beam. This is a round bottom model, rather flat at the stern, and of comparatively shallow draft. A 2½ h.p. Palmer motor is installed a little aft of amidships and is housed in with a seat on each side completely covering up the muffler and the electrical equipment. A metal hood is hung directly over the motor to protect it from the elements. The two seats abreast of the engine are fitted with folding backs having polished brass fittings. The after seat has a lazy-back, and there is one cross seat forward. All of the seats are fitted with cork-filled cushions covered with green pantasote. The interior of the boat is sheathed in selected cypress and is varnished, the decks are mahogany-finished, and the outside of the boat is painted white to the waterline and with anti-fouling paint on the bottom. All trimmings, including the cleats, chocks, steering wheel and tiller are of polished brass, and the stern band is also brass. Other popular models shown by this company are the 16-foot shallow-draft lake and river boat, and the 17-foot club sailing dory. There are also three types of rowboats shown—a 10-foot varnished flat-bottom tender, a 12-foot rowing skiff and a new 14-footer, which has been designed especially for use with an outboard motor. The regular Cape Cod bilge pump is also on display.

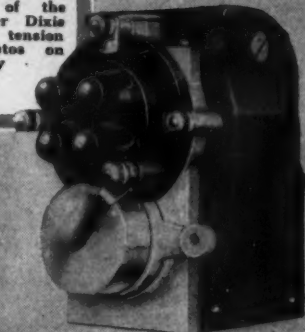
The Heins Electric Co., of Lowell, Mass., is exhibiting in addition to its regular ignition apparatus, mechanical and electric horns, carburetors and its new vacuum feed system. This company's mechanical horns, known as the Heco, is claimed to be the only hand-operated instrument of its kind which is of the rotary hammer type of construction. These hammers strike the sounding board with a series of rapid blows, declared to give a loud and penetrating signal. If any wear should occur, it is taken up automatically by the loose hammers. This horn, which is shown at the exhibit in complete and cut-away forms, is sold for \$4.

The Holospar Cooperation Co., of Edgewater, N. J., is showing for the first time a new departure in buoys, known as the Holospar. This buoy is made in much the same manner as a barrel, having staves of best grade cedar and an oak head in each end through which runs an iron rod with a free working swivel. The Holospar is hooped either with brass or galvanized iron hoops at the choice of the

One of the Monarch carburetors shown by the Monarch Valve Co.



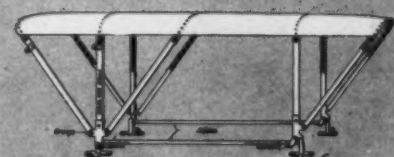
One of the Sumter Dixie high tension magnetos on display



Electric bow light with deck connection shown by A. S. Campbell Co.



Awning and boat top manufactured by C. F. McClellan



Divinhood exhibited by C. D. Durkee & Co., of New York City



## The 1916 Motor Boat Show

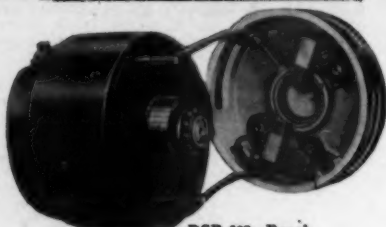


Cruiser built from Monitor knock-down frames

buyer, and all iron is heavily galvanized. At the top of the buoy is a permanent endless rope fender, and the top swivel is so placed that it cannot scratch the paint of a boat as it comes alongside. Of the two sizes in which Holospar buoys are made, No. 1 stands 2 feet 8 inches above the water-line, and is suitable for boats up to 40 feet in length, and No. 2 stands 4 feet above the water level and is intended for boats over 40-foot length. This company is also showing a self-locking mooring hook, which can be handled from the end of a pike pole, both for making fast and for releasing.

The Monitor Boat & Engine Co., of Newark, N. J., is exhibiting in space 21 on the mezzanine floor, and its display consists of the usual line of models of knock-down frames. These models which are arranged on backgrounds along the wall show thirty-five different styles and types of boats from an 8-foot yacht tender up to cruisers and work boats as long as 65 feet. The complete Monitor line, however, embraces about 700 sizes of boats, and this concern also manufactures several sizes of marine motors which, owing to the lack of space, are not exhibited. In addition to the K-D boats the company expects to have on the market in the near future a very complete line of knock-down furniture, some of which will be especially adapted for use in motor boats. Deck chairs and Pullman berths are part of the line, and the construction of this furniture throughout has been carefully studied to bring it within the easy accomplishment of any one.

The influence of the European war is making itself felt in one respect at this year's show, for the Matthews Boat Co., of Port Clinton, O., is showing a 2½ k.w. trench electric lighting set, mounted on skids and entirely self containing. This plant is automatic in starting and stopping, and a battery set is provided which is taken care of automatically without any attention on the part of the operator, thus permitting the use of the machine at isolated places where no skilled electrician is available. An order of these equipments is being sent to one of the foreign governments. Another interesting electric set on display is a 1 k.w. plant with low, light-weight base, and a third is an automatic plant which is being developed for marine and house service and which has a special light-weight base with cooling water tank under. In this outfit the engine, which is of the four-cycle type, is mounted on a common base with the generator. The equipment includes a radiator, Stewart-Warner vacuum feed system, magneto ignition, Schebler carburetor, etc. The plant is automatically started when about 15 per cent. of the capacity has been used, and when recharging takes place a slight overcharge is given so that the batteries keep up the voltage. If any heavy load is thrown on the plant, the motor automatically starts up and the load is taken on the generator and not on the batteries. Another feature that the Matthews Co. is working out for installation on its motor yachts is a coil heater inserted in the



DSR-183 Bosch lighting dynamo



Kingston mica plug



One of the newer models of Kingston carburetors



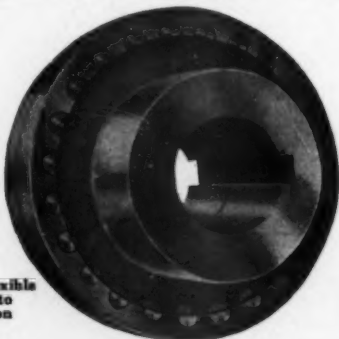
Joe's reverse gear built by the Snow & Petrelli Mfg. Co. who specialize in gears for all grades of service



The Baldridge reverse gear shown by the Baldridge Gear Co., of Detroit, Mich., also as standard equipment on a large number of engines at the show



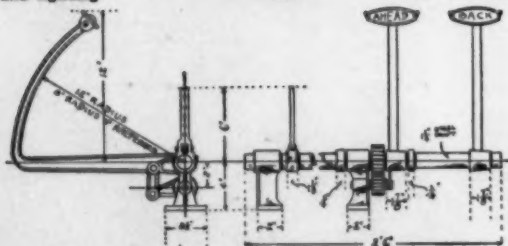
Yankee expansion silencer shown by E. J. Willis



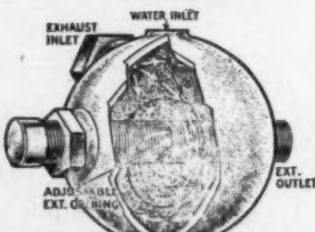
The Francha flexible coupling used to eliminate friction and vibration



The Edison storage battery for ignition and lighting



Pedal reverse control, manufactured and exhibited by the Columbia Brass Foundry, of Frospert, L. I.



Thermex silencer, which is carried by Chas. E. Miller



The Champion lighting set exhibited by Hector MacRae, of Baltimore, Md.

exhaust line, and it is said it will supply hot water for three or four baths in twenty minutes' time.

In the exhibit of this company there is no large boat shown, but photographs and all information pertaining to Matthews boats may be obtained from the salesmen in charge. This company is devoting a good deal of its attention these days to electrical specialties, and it is also making a feature of a high-grade yacht tender with a four-cycle motor of its own design installed.

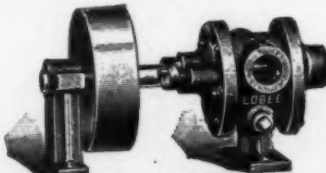
W. & J. Tiebout, of 128 Chambers street, New York City, have on display this year a full line of brass and bronze goods for motor boats, including chocks, cleats, flagpole sockets, sheaves, deck lights and port lights. There is also an interesting line of brass locks, knobs and escutcheons for the general steamship and yachting trade. In addition there will be samples of sailing lights built for electric and oil use, and there will also be samples of the well-known Star air and bilge pump which has been on the market for five or six years. The main keynote of the exhibit, however, is the line of brass and bronze goods for ship carpenters and the motor boat trade.

The George Lawley & Son Corp., of Neponset, Mass., is showing this year a 35-foot mahogany runabout of the same type as was exhibited last year. This runabout is of double-planked construction, the inside being of cedar and the outside of mahogany, with the engine hatches and cockpit of the same material, and the bulkhead neatly paneled. The power equipment located just forward of the helmsman's cockpit consists of a six-cylinder 60 h.p. Loew-Victor motor fitted with a Lecce-Neville electric starter and dynamo. In addition there is also displayed a 20-foot double-planked teak tender which is to be used on Colonel Nelson's yacht Xarifa. The builders believe that this boat is one of the finest pieces of work they have yet produced. She is equipped with a 20-35 h.p., four-cylinder Sterling motor installed forward of amidships under a hood with the helmsman's cockpit forward of that, and the owner's cockpit aft.

The Billings-Chapin Co., of Cleveland, O., has an interesting exhibit at the Palace consisting of displays of its U. S. N. Marine White, U. S. N. Deck Paint, Sparvar, Rostnicht and Anti-fouling copper paint, all of which products are especially prepared for use on all kinds of boats. Particular attention is given to the U. S. N. deck paint which is a piece of goods that has been on the market for about twenty-five years, and is used very extensively on both large and small boats along the Atlantic Coast. Representatives of this firm who will be on hand are Messrs. Knapp, Atkinson, Forbes and Reid.

Hector MacRae, of 316 St. Paul street, Baltimore, Md., is exhibiting a number of Champion lighting and ignition outfits of which the 6-150 model is the most popular type. This outfit consists of a 6-volt 150-ampere hour storage battery, a belt-driven dynamo operating at a speed of 1,800 r.p.m. and a 14 x 11-inch switchboard. Champion switchboards are made of Venetian slate and are put out in three styles. The No. 0 size has a double reading ammeter, a Champion circuit breaker or cut-out, charging switch, ignition switch and dynamo rheostat. The No. 1 board which is used with the 6-150 battery has the above equipment and in addition four flush switches for controlling the different lighting circuits. The No. 2 type for use with 12-volt and 20-volt batteries is of the same style and finish as the No. 1 board, but has a voltmeter as well as a double reading ammeter.

(Show Exhibits continued on page 66)



The Lobee pump used for circulation on a number of motors and shown by Chas. E. Miller



One of the Paragon reverse gears with special yoke operating mechanism, manufactured by the Paragon Gear Works, of Taunton, Mass.



# How Many

The Relation Between the Size Units in the

Answers to the First

## A Good Tabulation

(The Prize-Winning Answer)

**M**ULTI-CYLINDER motors are not by any means confined to boats of large size or excessive power. Rather they are often found in craft whose owners appreciate and can afford a quiet, sweet running power plant in a boat of any size. Many a yacht's launch is driven by a compact high-speed four or even six, while other similar boats may be powered with single or double-cylinder motors and give excellent service, minus, however, the former's flexibility, quiet running qualities and absence of vibration. On the other hand, we frequently find good sized tow-boats, freighters and heavy cruisers propelled by two-cylinder motors of liberal cylinder dimensions.

Naturally, in very large cylinder installations engine builders add cylinders to their motors rather than unduly increase the bore and stroke with the attendant increase in width and height of the machine; hence, most motor-driven vessels of considerable size carry motors of six or sometimes eight cylinders. There is, however, no hard and fast rule that can be given for this increase in the number of cylinders in the higher powered engines. To arrive at a ratio which can be made available for comparison we must take motor craft in the mass and by classifying them by length and type we can place against each class the number of cylinders used in a majority of existing craft of that description.

Of course, extreme examples cannot be considered under these headings. We know that the majority of boats of all classes under 25 feet are equipped with motors of one cylinder. From 25 to 35 feet two-cylinder motors would probably predominate, while above that length we find fours in large numbers, sixes in lesser numbers and some machines of eight cylinders. In purely racing craft of any size as built to-day six and eight cylinder motors with an occasional twelve are practically alone in the field, since the maximum of power for their weight is obtained in these highly developed machines. Some twin and triple screw installations are found in the extremely high-powered racing craft.

At the bottom of the page is a tabulation of present day types with lengths and number of cylinders for each.

A. O. GOULD, Portland, Me.

## Consideration of Various Types

**T**HE number of cylinders required in an engine to drive any certain boat successfully depends upon the type of boat to be driven, the speed required, and the service. Considering first the smallest type, such as the tender or fishing boat, we find here that a small single-cylinder motor embodies the simplicity, economy of space, small weight and sufficient power to meet ordinary requirements without unpleasant vibration.

Coming into the next stage, we have the

# Prize Contest in Questions and Answers

## Questions for the April Issue

1. Describe a satisfactory way to remove stuffing box lag screws which have broken off in the shaft log or deadwood.

Suggested by G. S. H., Boston, Mass.

2. Describe and illustrate a method of laying out an accurate motor boat race course without the use of surveying instruments.

Suggested by H. H. B., Schenectady, N. Y.

3. Discuss and illustrate a good arrangement for universal joint and thrust bearing when motor is set level.

Suggested by S. C., Oden, Mich.

## RULES FOR THE CONTEST

Answers to these questions, addressed to the Editor of *MoToR BoatinG*, 119 West 40th St., New York, must be (a), in our hands on or before February 19, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 19th of February.

The prizes are: For each of the best answers to the questions above, any article advertised in the current issue of *MoToR BoatinG*, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in the current issue of *MoToR BoatinG* which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For each of the questions selected for use in the next contest, any article advertised in this issue of *MoToR BoatinG*, of which the advertised price does not exceed \$5 or a credit of \$5 on any article advertised in this issue of *MoToR BoatinG* which sells for more than that amount.

family boats and runabouts of moderate speed, which, requiring more power than can be supplied by the single-cylinder unit, necessitate a motor of two or more cylinders, and so on, up to the larger cruisers. If a certain amount of power is necessary in conjunction with smooth running, the number of cylinders must be increased.

The factor of revolutions must be based upon the type of boat. If of the light-built speedy-line type, it is logical that such a boat will respond efficiently to a comparatively small wheel driven at high speed. On the other hand, a heavy full-bodied boat would require a wheel of diameter proportionate to its midship section and revolved at a more moderate speed.

Summing up, it is apparent that having arrived at the size and revolutions of the wheel which will efficiently drive a certain boat at the speed required, we can work back and select first the type of motor, and then the number of cylinders to give the required power.

L. H. S., New Albany, Ind.

# Cylinders ?

of the Boat and the Cylinder—Power Plant

Question in the December Issue

## Type of Motor Important

**W**HILE the relation which the size of a boat bears to the number of cylinders is very important, to my mind the most vital thing in the relation of the engine to the boat is the kind of engine—i. e., high speed, medium duty, or heavy duty. This, together with the number of cylinders the engine should have, is determined by the weight, type and construction of the boat in question.

Let us take for example a boat of the runabout type, say 25 feet long, of very light construction throughout. We wish to install an engine of 10 h.p. which we believe will give us a fair speed. What shall we take into consideration in making our selection of a motor, and how shall we determine the number of cylinders the motor should have? To install an engine of the heavy-duty type of one or two cylinders in such a boat would mean a very short life for the hull, the vibration being so excessive, the engine weighing so much, and the general strain on the entire hull being so great that it would not take very long to pound the latter to pieces, to say nothing of the discomfort of riding in such an outfit. Now let us consider the ideal motor for the boat we have in mind. This should be a two or four-cylinder engine (preferably a four if the boat is of extremely light construction) of the high-speed type. This motor would occupy very little space, as in all likelihood the cylinders would be cast en bloc, and the vibration, if it were a four-cylinder motor, would be very slight.

Let us now take a boat 25 feet long, of very heavy construction, of the raised-deck cruiser type. For the sake of the argument we shall consider a motor of 10 h.p. in this boat also. To install a high-speed motor of two or four cylinders would be decidedly improper; in this case, it would be the motor and not the boat that would suffer. The continual strain under which this motor would operate in propelling such a heavily constructed boat would soon wear it out, while the fuel and oil consumption would be much greater than that of a heavy-duty engine of the same horsepower. Even a one-cylinder engine of the heavy-duty type could be used in this hull with good results, but an engine of two or four cylinders would be preferable.

It is a well-known fact that an increase in the number of cylinders makes a more perfectly balanced and smoother running machine, reducing vibration, while riding in a boat equipped with a multi-cylinder engine is a pleasure enhanced. At the same time, there are many boats of sound construction, moderately heavy, where a one-cylinder engine of the medium or heavy-duty type will give decidedly good results.

Of course, in high-speed runabouts and hydroplanes it is necessary to have an engine of six or eight cylinders, in order to secure the power necessary to drive these boats at the desired speed.

HOWARD D. FISHER, West Hoboken, N. J.

Small Open Boats	Open Launches	Fast Runabouts		Cruisers			
Under 20 ft.	20 to 25 ft.	25 to 30 ft.	30 to 40 ft.	25 to 30 ft.	30 to 35 ft.	35 to 50 ft.	50 to 75 ft. 75 to 100 ft.
1 cyl.	1 or 2 cyls.	4 or 6 cyls.	Single or Twin, 6 cyls.	2 cyls.	2 or 4 cyls.	4 or 6 cyls.	4 or 6 cyls., 6 or 8 cyls., or Twin, 4 or Twin, 6 cyls.

When you send in your answers you must state what you will take for a prize should you win one

# From Make and Break to Jump Spark

Several Methods by Which the Ignition of a Marine Engine Can Be Changed, Together With the Various Reasons Advanced for the Advisability of This Alteration

THE PRIZE CONTEST—Answers to the Second Question in the December Issue

## For Experimental Purposes

(The Prize-Winning Answer)

THE drawings show how a jump spark outfit was added to a heavy-duty two-cylinder four-cycle Buffalo make and break engine. The make and break system is left in place, the igniter fingers merely being fastened back so as not to break on the cams while the jump spark system is being used.

As originally designed, the make and break igniters are located on caps bolted over the inlet valves, the igniter fingers being snapped by means of two superimposed cams revolving on a vertical shaft. The spark timing is changed by shifting a spirally grooved sleeve on this shaft.

The timer, a two-cylinder 90-degree type, is shown in the illustration mounted upon the end of this vertical camshaft, the steel collar which was originally placed on the end of the shaft being removed. This makes an ideal location for the timer, as it is so easily accessible. The timer is not controlled by its ordinary handle and rod, but this rod or handle is clamped so that it will not move and the timing is changed by shifting the camshaft by the same control lever as is used for the make and break system.

An inch and a half cap was screwed into the center of each cylinder head, each cap being provided originally with a brass priming cup. These caps are drilled out and tapped for spark plugs and a plug coil (a spark plug with a self-contained jump spark coil) is screwed into each cap. The spark thus occurs in the center of the cylinder head instead of over the inlet valves as with the make and break. As priming cups were absolutely necessary, these are shown tapped into the make and break igniter caps over the inlet valves. It is necessary to extend these by means of one eighth-inch brass pipe (iron pipe size) and couplings in order to clear the igniter posts.

A separate vibrator and condenser box is used; of course, regular spark plugs and separate coils would serve just as well, but the plug coils are waterproof and compact.

A double-throw switch can be used to switch the battery or dynamo from one system to the

other, or separate sources of current can be provided. In this case the engine was provided with an A-C low tension magneto which would not operate a jump spark coil, so a storage battery furnished for starting on the make and break system is used to run the jump spark.

In regard to the benefits to be derived from changing to jump spark, in this case there are none, except for a slightly more quiet operation due to the absence of the working cams and snapping fingers. The make and break system requires no attention, it operates with a very simple but powerful magneto which has but one brush and no timing apparatus, and the spark coil is used only when starting on the battery, the magneto being connected directly to the igniters. There are no high tension wires to give trouble.

The make and break system has been in operation for four years, with but one change of spark points; the engine has missed fire perhaps half a dozen times in four years. The jump spark attachment is for experimental purposes only, but any one preferring this system could install it as shown and hold the other in reserve.

H. H. PARKER, Oakland, Cal.

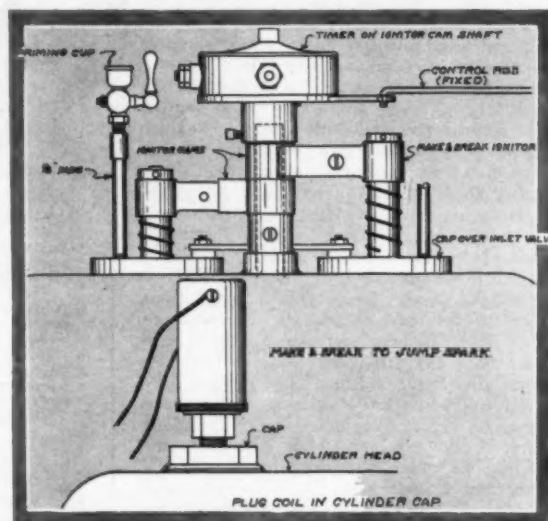
## Overhead Plugs Fitted

PROVIDED the make and break ignition system of a motor is of good design, there can be no advantage in changing to jump spark, but on many of the old model marine motors the make and break systems are very crude and capable of improvement.

For three years I have had an old model three-cylinder, four-cycle, 18 h.p. engine of the heavy-duty type, every working part of which was of excellent design and in good condition, excepting the ignition—an antiquated make and break affair. Quarter-inch iron rods were connected from the cam-lifters to the flipper of each igniter, and the contact was made and broken in the regular way. If, due to vibration or other cause, these rods worked appreciably out of line with the igniters (which they very often did) a short circuit resulted. When the springs were rusty these rods would not drop with enough snap to be effective, and to oil them would soften the fibre washer between the flipper and spring. The platinum points at times stuck, and to remove the igniter required time, as it was set in place by a stud and nut at top and bottom. These difficulties naturally resulted in unsatisfactory running of the motor.

Early last spring I decided to change to jump spark, and bought a three-cylinder timer—a stock article—and installed it in place at the end of the camshaft, as per illustration. The camshaft extended five inches beyond the base of the engine, with a diameter of one inch. By placing a half-inch reducer from the camshaft to the timer, the installation was made. The spark plug holes were then drilled in the cylinder heads. (The make and break igniters were on the side of the cylinders, and I left them there.) I also procured a three-cylinder vibrating coil, and ran three wires from the timer to this coil, one for each cylinder,

and then connected three high tension cables from the coil to the plugs. The proper timing of the spark was readily determined by turning over the flywheel and bringing each piston up to dead top center, setting the



Mr. Parker fitted a jump-spark system to his motor for experimental purposes, leaving the igniter plugs in place

time quadrant when the buzz was heard in the respective cylinder unit of the coil.

The rotative speed of the motor was increased about 20 r.p.m., but, of course, on a heavy-duty machine, the weighty construction of the reciprocating parts predetermines just what the r.p.m. of the motor should be.

The result of this change was eminently satisfactory, and although I ran my cruiser, Kathryn-K (a picture of which appeared in MoToR Boating about three years ago), all of the past summer, it was my first season to be entirely free from engine trouble. The great ease in starting, and the general flexibility of the motor, have more than recompensed me for the small outlay in changing to jump spark.

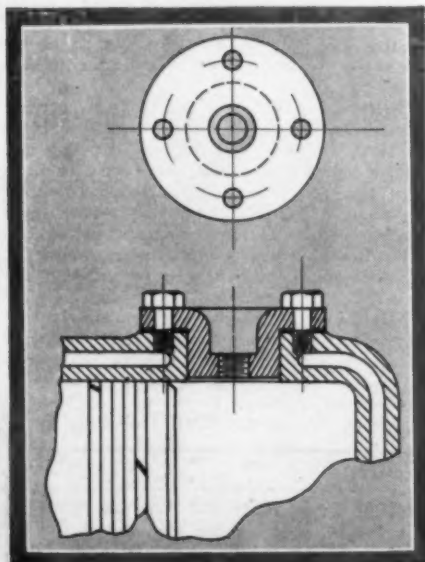
JOSEPH WARREN KEEFE, JR.,  
Jersey City, N. J.

## Making a Timer

THE first thing to do in changing from make and break ignition to jump spark is to remove all of the make and break igniter parts, any holes or openings left being closed up with suitable flanges or tapped out for the insertion of suitable plugs. The hole in the cylinder head where the insulated electrode was sometimes placed might be used for the spark plug by making a special bushing or even by tapping out the old igniter.

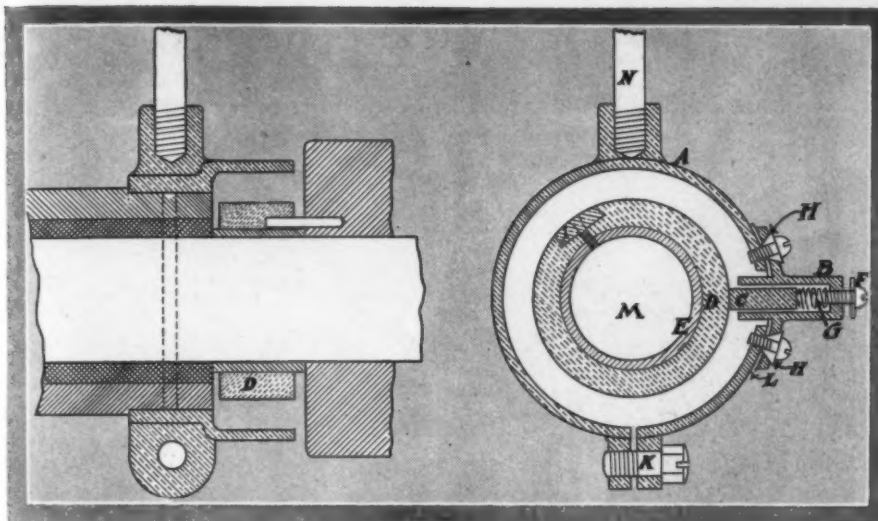
Considering up-to-date practice, probably the best jump spark ignition would be obtained from a good high tension magneto. This must be driven through gears or silent chain from the camshaft of a four-cycle and the crankshaft of two-cycle engines and timed so that a spark is produced in each cylinder at the end of the compression stroke.

However, as most of the make and break engines are of the older patterns and as a good high tension magneto is quite expensive, probably a timer, vibrating coils and battery current would be preferred, so this equipment will be described.



Flange for spark plug suggested by Mr. Danielson to take the place of the make and break cage





Details of the timer designed by Mr. Christie for use in conjunction with a jump spark system

The timer may be elevated and driven through miter gears. This is considered good practice, as the timer may be placed in an accessible position. Should this plan be followed a pair of miter gears will be required. Probably the best place to get these if for a two-cycle engine is from the builder of similar engines. Smaller gears are required for four-cycle engines, about  $1\frac{1}{4} \times 2$ -inch pitch-diameter. These are usually carried in stock by gear manufacturers and can be bought cheaply.

Brackets will be required to hold the timer shaft in position. A wood pattern can easily be cut for these, from which brass castings can be made. Any good timer can be used and there are a number on the market that sell for a reasonable price.

The timer shown in the sketch is intended

to be used directly on the main journal or the end of the camshaft. It is suggested for those who don't care to install a bevel gear timer. The principal objection to this style of timer is that it is more or less inaccessible when located between the flywheel and the engine. To overcome this objection the brush holders are designed so as to be easily removed for inspection by taking out two screws. Only one brush holder is shown. One must be provided for each cylinder.

The advantage of the change to jump spark would depend greatly upon how the make and break outfit was designed and built. Several very satisfactory make and break igniters have been produced, especially when used on medium or slow-speed engines.

Most of the trouble experienced was with the mechanical devices used to close and break

the circuit within the cylinder. These parts often showed considerable wear; sometimes the compression leaked around the movable electrode, and at other times it became corroded and stuck. Owing to the length of time that the circuit is closed this form of igniter is considered hard on batteries where dry cells are used. On the other hand, the electrical part is very simple. Owing to the low tension current used, a short circuit or leakage of current is unlikely and little trouble is experienced with this part provided the connections are all tight and the battery is not dead.

The mechanical devices used with the jump spark system are very simple and quite durable, while the electrical part, owing to the high voltage, is much more complicated. Objections to the jump spark on this account have been overcome by providing better insulation, better plugs, short wires, improved connections and a better understanding of how to protect the ignition outfit from water.

Another advantage of the jump spark system is that the different parts such as plugs, coils, timers, etc., have been highly perfected by specialists and manufactured in large quantities, thus reducing cost, while the make and break igniters were mostly made in limited quantities by the engine builder. This made them expensive.

C. H. CHRISTIE, Saginaw, Mich.

## Changes Not Always Advisable

IT is not always advisable to make changes in the ignition system on an engine, especially when the manufacturers have a reasonably good reputation for making reliable engines, as they usually have an adequate reason for using either jump spark or make and break.

On slow-speed engines operating with a high compression it is quite necessary to use the make and break system, as it is more positive under adverse conditions. High compression

(Continued on page 63)

# Harnessing the Main Engine

Some Ingenious Arrangements for Hooking Up the Boat's Power Plant to the Capstan and Making It Do the Work of Raising the Anchor—Prize-Winning Device Used in a Florida 40-Footer

THE PRIZE CONTEST—Answers to the Third Question in the December Issue

## In Actual Operation

(The Prize-Winning Answer)

THE device illustrated in the inclosed photographs and sketch has been in operation for the past year and is giving perfect service on our 40-foot cruiser Miss Anne II, home port Jacksonville, Fla.

Power is transmitted to the windlass through a friction pulley in contact with the flywheel of the main engine and a worm gear to give the necessary power at a low number of revolutions of the windlass drum.

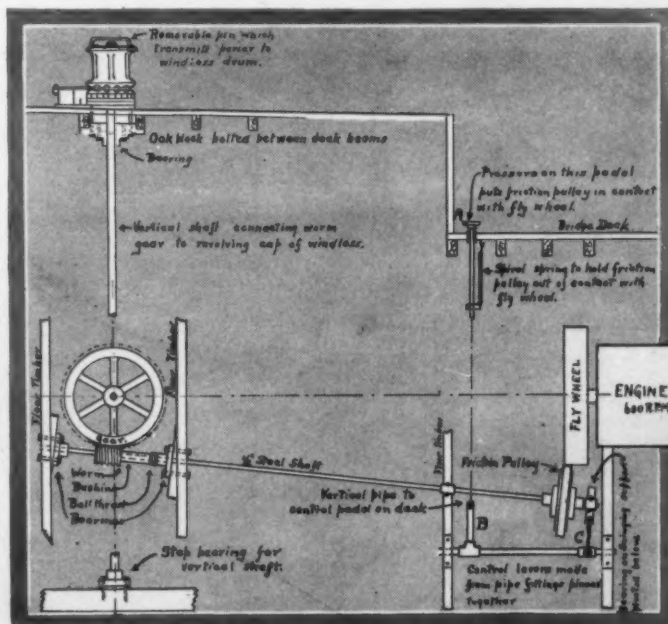
Pressure applied on the pedal A, located on deck near the steering wheel, is transmitted through the long lever arm B and short lever arm C to the swinging support of the bearing next to the friction pulley. The friction pulley is normally held out of contact with the flywheel by a spiral spring on the control rod. The friction pulley is about one-half the diameter of the flywheel and is located so that the shaft going forward to the worm gear passes under the cabin floor. This shaft has a speed of 1,200 r.p.m. and drives the vertical shaft to the windlass through an 80 to 1 ratio worm and gear, giving the windlass drum a speed of 15 r.p.m.

This apparatus is constructed, as much as possible, from standard fittings, the only special casting required being the worm and gear which was ordered from a gear works at a

cost of about \$12.

The control rods are made from pipe and fittings pinned together to prevent turning in the threaded connections. The friction pulley consists of several discs of thick friction paper supported on each side by an eighth-inch iron plate and bolted between the halves of a flange coupling to form the hub of the pulley. Sufficient friction paper is used to give the pulley a one and one-half inch face.

Two pillow-block bearings are used—one next to the friction pulley mounted on a movable support, and the other on a shaft about two



Plans of the device designed and put into operation by Mr. Corse for diverting the power of his motor to the anchor capstan

feet from the friction pulley, mounted so that the shaft is straight when the pulley is in contact with the flywheel.

The worm is mounted between two bearings, made from the halves of a flange coupling, one bolted to the floor timbers on each side. A bushing and ball thrust take up the end thrust of the worm. The gear turned by the worm, about twelve inches in diameter, is located in a horizontal position under the cabin floor and mounted on a vertical one-inch shaft. This shaft is supported by two bearings, one just below the gear and the other on the under side of the deck. Another flange coupling is used to make these bearings. The vertical shaft passes through the deck and is keyed and held by a nut and taper bore to the cap of the windlass.

An Andrade automatic vertical windlass is used because it will take both chain and rope and is easily adapted to the power drive. The only machine work necessary on the windlass is in keying the cap to the vertical shaft and boring holes through the flange on the base for holding down bolts. The windlass is constructed to be held in place by a large bolt which goes through the center of the cap and into the deck. This bolt is replaced by the vertical shaft.

The revolving motion of the cap is transmitted to the drum of the windlass by a U-shaped pin, the ends of which fit into two holes bored through the cap and into the top of the drum.

A galvanized chain is more convenient to use than rope, as it will pass around the lower part of the drum and into the chain locker without being handled.

The operation of this device is very simple and can be done by one man. First the U-pin is put in place and power is applied by pressing one foot on the control pedal. The anchor is then raised to the surface, this position being indicated by a marker on the chain. The U-pin is then removed and the anchor pulled up into the hauser pipe by hand operation of the windlass. The anchor can be lowered and the windlass operated by the hand lever in the usual manner when the bevis is removed.

The power obtained from the friction pulley is far greater than can be developed by manual operation of the windlass. Ten pounds pull at the face of the friction pulley will give about a thousand pounds at the anchor chain.

Such a device as this is of almost inestimable value on a cruiser of any size, as it may be used as a muscle saver in more ways than the one for which it is primarily intended.

H. M. CORSE, Jacksonville, Fla.



Pedal control of the power winch on Mr. Corse's 40-foot cruiser

### Bevel Gearing

THE drawings show a capstan on deck driven by the main engine of the boat through bevel gears and a clutch pulley which is controlled from on deck.

The clutch is not driven directly off the flywheel, but is belted from a small pulley fastened in front of it. This permits the location of the clutch and shafting overhead or alongside the engine where it is out of the way. Furthermore, the belt can be removed and only put on when it is necessary to run the capstan, thus saving wear and tear.

The drawings show a simple form of expanding ring clutch, a type which has proved satisfactory for various kinds of machinery. The split band (Fig. 1) is provided with a steel pin driven into it opposite the split but which fits loosely into the hole in the flange (Fig. 2), thus causing the ring to float

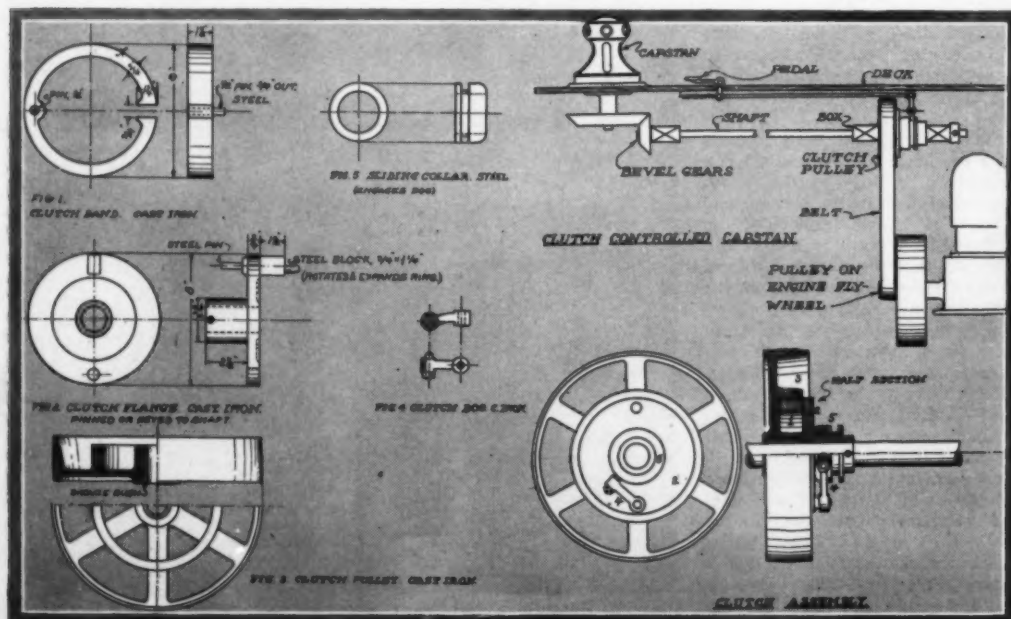
The friction pulley which is brought into engagement with the engine flywheel (partly shown at the left) by pressure on the pedal. The capstan itself is shown in the circle

between the flange and the clutch pulley. This pulley is a special type with its arms (if small could have solid web instead of arms) cast on one side and an internal ring cast on to the arms. This ring is finished on its inner side and is engaged by the expanding band (Fig. 1). The square steel block shown in Fig. 2 is slightly rotated by means of the collar (Fig. 5) sliding along the hub of flange 2 and engaging dog 4, which is pinned to steel stub shaft extending from the block. This causes the band to expand and grip the pulley; when the clutch is released the pulley runs freely on its shaft.

The clutch band shown is eight inches in diameter, which should be large enough to handle a winch or capstan on a forty-footer. The size of the pulleys would have to be determined for each individual installation, as would the size of shafting, gears, etc., the installation shown in drawings being merely a suggested one.

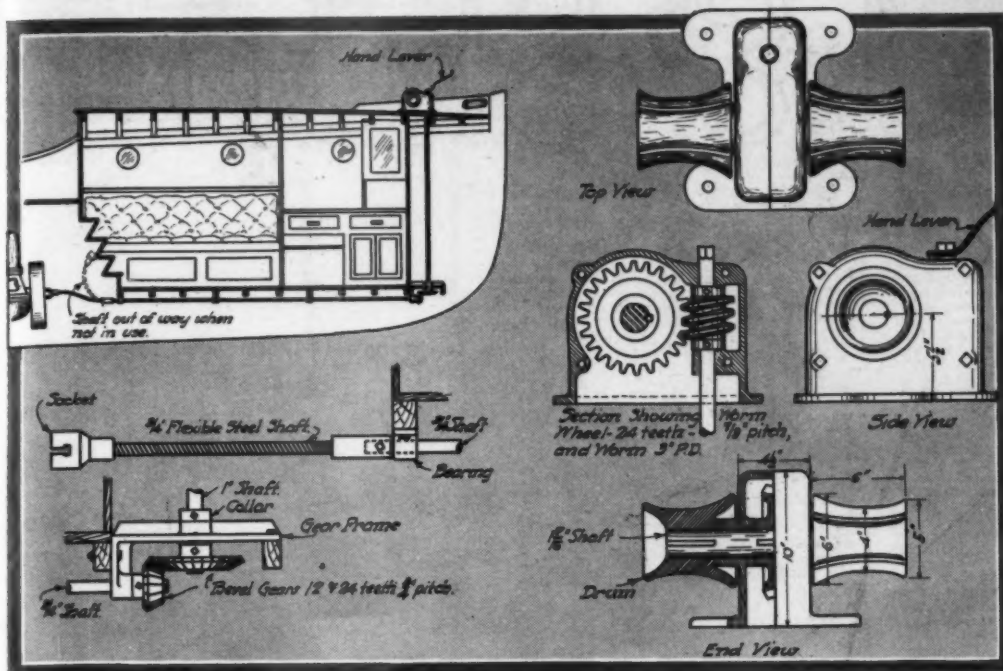
The operating pedal is placed near the capstan, but could be installed on the bridge if desired.

H. H. PARKER, Oakland, Cal.



Complete details of a clutch-controlled capstan devised by Mr. Parker which operates by belt drive and bevel gears





Mr. Kelley's device differs from the others in that the rigid shafting is installed beneath the cabin floor and is turned by the engine through a detachable flexible shaft crankshaft

## Useful for Many Purposes

**A** POWER windlass can be used advantageously for many purposes besides raising the anchor; winding up to a dock against a strong current or wind, snubbing through locks or rapids, pulling off shoals or sand bars and as many other purposes as necessity demands.

Then a machine for this purpose should be designed to take a line from nearly any point of the compass and of such type as not to become filled as the spool types of windlasses do when a long line is used. Another advantage a capstan has over a spool type windlass or crab is that the operator has full control. For he may take in line, hold what he has or let out without stopping the capstan, this all being controlled by the tension applied to the hand line. Then again, the ropes, chains or cables are kept in coils where they soon dry, causing no undue rot or rust, and can later be stored away in a convenient place.

The accompanying drawing shows a revolving capstan which is driven by a fiber friction wheel running against the flywheel of the engine, the power being transmitted through and the speed reduced by a worm and gear placed below the floor in the forward end of the boat.

By placing the horizontal shafts under the floor and carrying the vertical shaft up through a partition the only visible parts outside of the engine-room will be the lever in the cockpit and the capstan on the deck.

The fiber wheel is made of sheets of about 3/16-inch fiber bolted between two cast iron flanges. The length of the shafts, lever, etc., must be made to suit the boat; four bearings are required, two on the verti-

cal or capstan shaft and two on the lever shaft.  
M. A. WRIGHT, St. Paul, Minn.

## Uses Flexible Shafting

**C**AREFUL inspection of the accompanying illustration will show just how the engine is used to operate a worm drive windlass on the forward deck for raising the anchor, etc.

The engine crankshaft, in projecting beyond the flywheel for a short distance, permitted a pin to be placed through it, in such a manner that a socket provided on the end of a

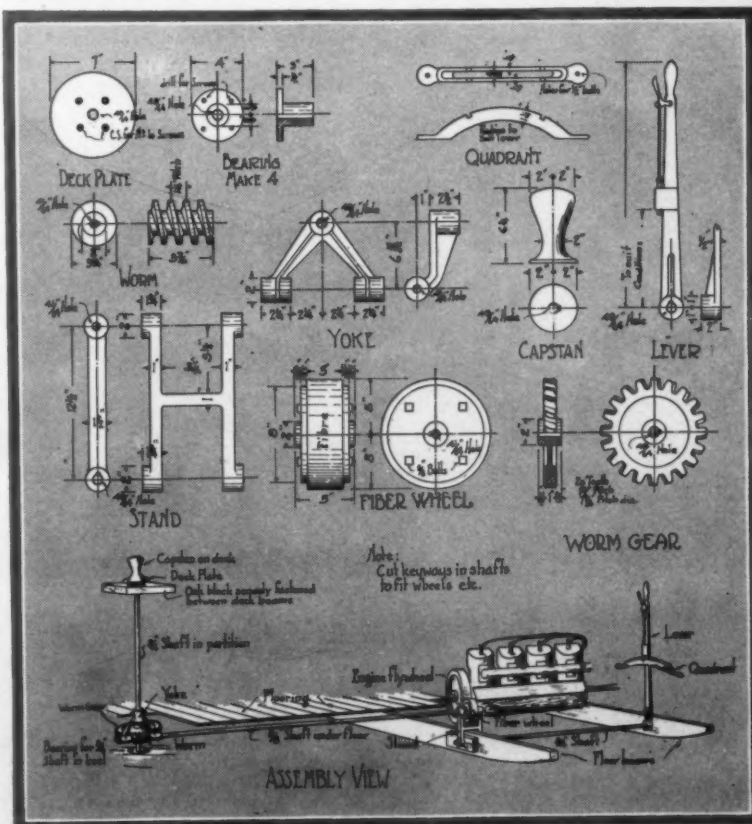
engine, and are necessary because the shaft under the floor is so much below the engine shaft. It is amply strong enough for the small power and infrequent use. When not in use the shaft is hooked up out of the way, and then the windlass can be operated by the hand lever attached to the squared end of the projecting vertical shaft. Of course, all the shafting will move, but as it is not attached to the engine it does not matter and will waste only a little power. This type of windlass locks itself without ratchets, and the worm shaft must be turned to move the drum in either direction.

The casing is split down the center, being cast in two pieces because the patterns are much simpler and more easily made in that way. The joint is then finished, and four holes are drilled through both pieces for the finished and fitted bolts which hold the casing together. After all the machine work is done, have the whole casing galvanized. The wide base with four holes is bolted through the deck into heavy deck beams especially reinforced for this purpose.

All the gears are stock sizes, readily purchased. For the mechanically inclined owner, the construction of this windlass will be interesting, and it will form an attractive addition to the boat.

In this day and generation, when it is the common thing to let mechanical power do the heavy work, such a device as this is more of a necessity than a luxury. It may be used in other ways than raising an anchor, and with the proper davits and tackle it can be utilized for lifting the tender on deck. For kedging off it is equally valuable.

L. R. KELLEY,  
Philadelphia, Pa.



Complete working drawings of the arrangement suggested by Mr. Wright.  
Exact dimensions of all the parts are given

# Yard & Shop

## The Auxiliary Schooner Kitty A

The heading illustration this month shows lying in her berth at Newport, R. I., the 60-foot sea-going schooner Kitty A, which returned recently from an interesting trip to the Azores and western Africa. This boat is owned by Henry Amory, of Boston, Mass., and was originally built for a fishing schooner of the Gloucester type. She has been converted from a fisherman into a cruising schooner, rigged for deep water work and is now equipped with a two-cylinder 18-24 h.p. Kahlenberg kerosene-burning engine.

She left Newport on June 29th, 1915, and after running through a bad southeast gale in the Gulf Stream, made the remainder of the trip to the Azores in good weather, the first landfall being recorded after seventeen days at sea. During this passage the winds were very light, and the owner states that his engine was used to great advantage. After visiting many of the Azore Islands, Kitty A. was got under way for Madeira, and after staying there for a few days, she left with a heavy northwest wind for the Canary Islands. From the Canaries the owner and his party set out to accomplish the object of the expedition, which was to collect birds of these islands for the Museum of Comparative Zoology of Harvard University. After hunting in certain of the Canaries they went to Morocco on the African shore during which run the engine was used constantly because of continued head winds. By this time they were entirely out of fuel, but the commander of a French battleship at Agadir courteously furnished them with a revenue cutter which towed them to Mogador, a distance of 80 miles. On returning to Grand Canary, some three weeks later, the vessel fitted up for the long voyage home, although some difficulty developed in obtaining kerosene because it was thought that submarines operating in the vicinity might force them to surrender it—but eventually 800 gallons were taken aboard, as well as 50 gallons of gasoline. Setting sail for Newport on October 5th, Kitty A. arrived in port on November 10th, having been thirty-five days at sea. From Bermuda to Newport, although a distance of only 650 miles, two weeks were spent in covering the distance, because of continuous head winds. The owner states that the vessel proved herself most seaworthy and that the Kahlenberg engine never failed when she was needed. Approximately 1,600 gallons of kerosene were used.

## Brooks 17-Foot Hydroplane

Motor boatmen have often wondered why it is that no motor craft has yet been designed which will prove as popular as any one of a dozen motor cars that are turned out by the thousands. Pronounced tastes, difficulties of quantity manufacture, as well as various other considerations militate against the production of any such world-beater, but the Brooks Mfg. Co., of Saginaw, Mich., thinks that in its 17-foot hydroplane it has solved every problem. At any rate, this company is planning to turn out ten thou-

principle.

Any power from 4 to 25 h.p. may be installed, giving from 10 to 32 m.p.h., according to the size of the motor, the boat planing at 17 m.p.h. Owing to the various arrangements under which this boat is sold, it is possible for practically every taste and pocketbook to be suited. For \$45 the complete knock-down hull with turtle deck forward may be purchased; for \$95 the finished boat with fuel tank under the deck, steering gear installed and the engine bed ready to receive any motor may be obtained; \$110 buys a complete knock-down boat together with a 4 h.p. single-cylinder motor, and there are other prices and equipments.

We are informed that on one of the trial trips a speed of 22 m.p.h. was obtained from an old 1912 model 12 h.p. Erd motor, which had not been tuned up and was, therefore, not doing its best work. This seems to be a very excellent showing for a boat of this length.

A 15-foot model of similar design for use with an inboard or outboard motor is also being offered by the Brooks Company.

## Van Blerck Prepares for Big Year

As exemplifying the scope of tremendous preparations the Van Blerck Motor Co., of Monroe, Mich., is making for the prompt filling of all orders during the 1916 season, it has furnished us with a partial list of material which it now has on order for immediate delivery. The net total of these material orders at this time exceeds \$1,000,000.

### 1916 VAN BLERCK MATERIAL CONTRACTS

250,000 lbs.	Crankcase bronze
110,000 lbs.	No. 12 aluminum
150,000 lbs.	Heat-treated steel
1,000 ft.	1 1/4-inch chrome nickel steel
150,000 ft.	High tension magneto wire
3,000 ft.	Electric starter wire
25,000	Spark plugs
1,200	Complete Leece-Neville electric starters
500	Two-spark high tension magnetos
1,000	Camshafts
500	Paragon reverse gears
500	Finished crankshafts
2,000	Finished cylinders
5,000	Finished pistons
1,000	Sets of main and connecting rod bearings
	Studs, nuts, bolts, necessary iron castings, etc., for above motors
20,000	Piston rings

The Van Blerck factory is now working in two shifts, a 10 1/4-hour day shift and a 12-hour night shift—and it is expected that this schedule will be maintained throughout the winter. The huge addition to the present factory has been completed, enabling the



sand of its new model during the coming year.

This 17-footer is designed with a beam of 45 inches and a hull draft of 6 inches. It may be purchased in knock-down form or as a complete boat, and it is constructed with a compartment forward for housing the motor and also with a large open cockpit. It is of V-bottom design, modified so as to embody the hydroplane

concern to increase its production ten times over that of one year ago. Machinery is being purchased for this addition as fast as it can be obtained from the manufacturers.

The executive office has recently been transferred to a new building that gives more than twice the floor space than was occupied formerly. A steam-

Details of construction of the Brooks V-bottom hydroplane, as well as the completed boat in action. This 17-footer is also made with the motor housed under a forward deck



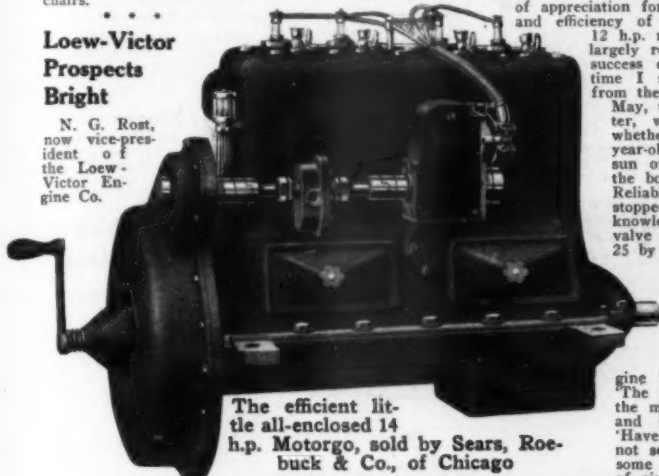
heated, electric lighted brick garage with a capacity of seven pleasure cars and two trucks has also just been completed in order to house the private cars of the various executive officers.

### Ackley 25-Foot Runabout

The Ackley Boat Bldg. Co., of 39 Main street, Cincinnati, O., builds a very complete line of high-grade displacement boats, hydroplanes, etc., and has had a great deal of success with its 25-foot sea-going runabout. This V-bottom model, which has a beam of 5½ feet, a freeboard forward of 3 feet 2 inches, and a draft of 1 foot 3 inches, is declared to be a rough water boat in the fullest sense of the word. The underbody is designed to prevent pounding or rolling and the freeboard is sufficiently high to make it extremely dry, even in a sizable sea. It is regularly built with a square transom (unless the V-type is ordered), which gives greater buoyancy and more speed. With a model H-B Scripps motor installed the speed is approximately 25 m.p.h., and the hull is capable of carrying much greater power with a weight limit of about 1,100 pounds. The cockpit, which is covered with an automobile top, has a comfortable seating capacity for six persons and in addition may be fitted with a thwartship seat or with four wicker chairs.

### Loew-Victor Prospects Bright

N. G. Rost, now vice-president of the Loew-Victor Engine Co.



The efficient little all-enclosed 14 h.p. Motorgo, sold by Sears, Roebuck & Co., of Chicago

of N. Y., states that he has never seen prospects so bright. The New York office has been open for only two months and more Loew-Victor and Harbeck engines have been sold in that time than in any other similar period of the company's history.

### Durkee's Divinhood Popular at the Y. M. C. A.

Last fall when the Central Branch of the Y. M. C. A. was opened in Brooklyn, Chas. D. Durkee & Co., of 2 South street, New York City, were asked to suggest something as an attraction, and as a result the Dunn Divinhood was demonstrated in the big swimming pool. It was to be a one-day exhibition, but the interest displayed was so intense that it lasted until the celebration was ended, and for several days after, when the management satisfied the curious by allowing them to pick up pennies and walk around under water to their heart's content. The field for this improved diving apparatus, however, is not limited to such exhibitions, for it is declared to be invaluable for fixing the shoe or disentangling a wire rope from a propeller without hauling out. As has been stated in this magazine, it slips over the head, rests on the shoulders without any strapping, and can be lifted off without any trouble. One's limbs are always as unencumbered as if one were working on dry land, and it is stated that it is possible to remain under water for hours without the slightest inconvenience.

### Jaeger Lamp Company Builds New Plant

The demand for Jaeger nitros, the gas-filled lamps for searchlight use, which are manufactured by the H. J. Jaeger Co., of 68 Hudson street, Hoboken, N. J., has compelled the com-

pany to build a new three-story plant. This factory is 200 feet long by 60 feet wide, and its erection puts the company in a position to turn out approximately twenty thousand lamps per day. This company manufactures the nitrogen-filled electric lamp which was invented and perfected by H. J. Jaeger. It is declared to have been the first gas-filled lamp put on the American market. It gives a pure white light of great efficiency.

### "Old Reliable"

Testimonials from satisfied owners give the manufacturer the same feeling, it may be supposed, which suffices a proud father when he learns that his son at college has captured honors, scholarships and the football captaincy as well. The following received by the Kermath Mfg. Co., is a case in point: "I cannot put my boat away for the winter without sending you a word of appreciation for the working and efficiency of the Kermath 12 h.p. motor that was so largely responsible for the success of it. From the time I received the boat from the builder on the 28th day of May, until I laid it up for the winter, whether I ran it myself, or whether it was my wife or my 12-year-old son, it was always ready, in sun or rain, in calm or blow, until the boat became known as the "Old Reliable" by the neighbors. It never stopped and only skipped twice to my knowledge, which a turn of the needle valve soon righted. My boat is a 25 by 5-foot open hull family launch, and will seat ten people. With a fair load, she will go 12 to 14 miles per hour, and with two people will make from 15 to 17 m.p.h.

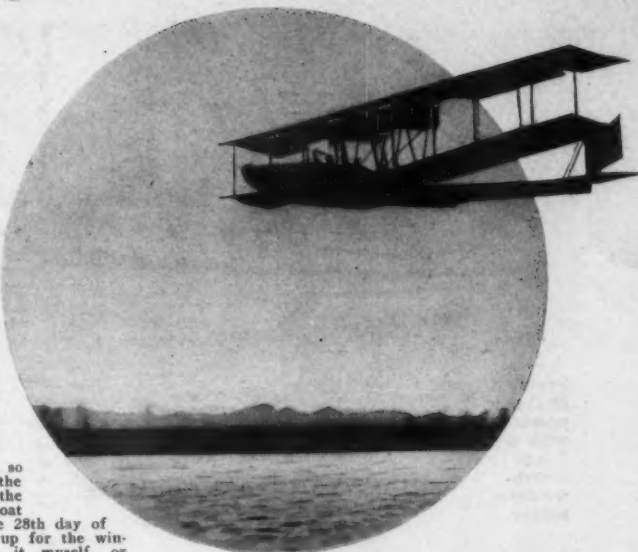
"I used the boat entirely on the St. Lawrence River and every one who saw the engine had nothing but praise for it. The best engine for the money on the market. 'Give it half a chance and it will last you a lifetime.' 'Have run mine two years and have not seen the inside of it yet,' were some of the striking things owners of similar motors told me. All are enthusiastic about it, and none more so than myself.

Yours very truly, Walter S. Crocker, Utica, N. Y."

### A Satisfied Gordon User

The following letter to the Gordon Propeller Co., of Cleveland, O., from A. J. Smith, of Milwaukee, Wis., explains itself. We might say, however, that it illustrates the friendly relations which obtain when courtesy is one of the ingredients of a business transaction. The letter follows: "I am today sending by American Express the set of 12-inch blades which you forwarded me. I did not even try them out—the 13-inch blades proved so satisfactory. I am more than pleased with my outfit, as it does the work finely, and I believe the speed of my boat was increased about 15 per cent. with the new wheel.

"I might sell my boat, and I can assure you that when I buy another the Gordon is the only wheel which I will consider. I wish again to thank you for the very courteous treatment I have received from you, and I beg to remain, Yours very truly, A. J. Smith."



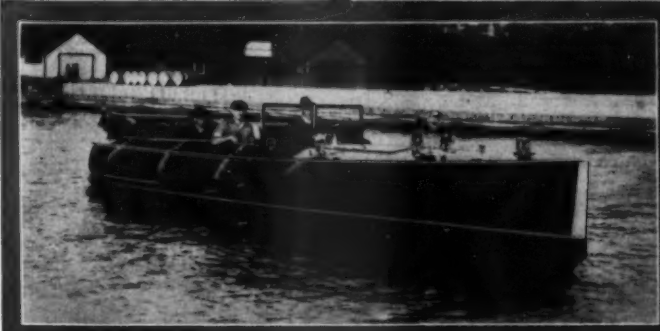
A huge Benoist flying boat, powered with one of the Roberts six-cylinder 100 h.p. motors, giving a speed of 67 miles an hour

### Automobile Man Buys Smith Hydro

We are informed that the C. C. Smith Boat & Engine Co., of Algonac, Mich., has under construction a one-step hydroplane for Henry B. Joy, president of the Packard Motor Car Co., of Detroit, Mich. This hull will be of the Miss Detroit type, except that the engine will be placed under the hood in the forward plane and driven direct. The boat will have a seating capacity for four persons in the after cockpit, and it is expected that it will prove to be the fastest pleasure boat in the world. It will be equipped with a 200 h.p. V-type twelve-cylinder motor, and will be fitted with a Packard steering wheel and centralized control system, so that the pilot can operate the entire mechanism from his seat. Features of the motor include thermostatic control of the temperature of water and lubricant, and the boat will be equipped with a complete electrical system.

### Highest Award for Wisconsin Rowboat Motor at P. P. I. E.

L. E. Vogel, president of the Wisconsin Machinery & Mfg. Co., of Milwaukee, Wis., recently received word from the officials of the Panama-Pacific International Exposition that the Wisconsin rowboat motors had been awarded the highest honors. The customary symbols and the detailed statement of the award have not yet been received, but it is said that this is the only honor conferred on any one of all the rowboat motors which were exhibited.



Bella Vista II, a 30 x 6-foot 2-inch runabout owned by J. P. H. Cunningham, of New Castle, Pa. She is powered with a Model 13 40 h.p. Loew-Victor motor, which gives her a speed of 20 m.p.h. with six passengers



Scout, a 26-footer powered with a 7 h.p. North-western motor

Relative to the Wisconsin Co.'s 1916 plans, Mr. Vogel stated in a recent interview: "Prospects for large business have justified us in making substantial purchases of raw material and also additional machinery. Our 1916 line will comprise six models of detachable rowboat motors and our usual marine motors, which range in horsepower from 5 to 60, and from one cylinder to six cylinders. It has always been our policy to construct marine engines and rowboat motors of the highest possible quality of materials and on correct and proved mechanical principles. We are gratified that our own judgment of our product is endorsed by the Jury of Awards, although this is not the only evidence of a similar nature."

"Although our largest market is the United States, there is hardly a country on the face of the map that is not using our motors in ever-increasing volume. It is our feeling that the detachable rowboat motor will continue to gain in popularity because it performs an excellent service and contributes greatly to the pleasure and comfort of mankind."

"Our optimism," concluded Mr. Vogel, "is justified further by the fact that during the past three months we have been working day and night to take care of our business. Orders are easier to get than materials."

#### Elkhart's Business Booming

The Elkhart Mfg. Co., of Monroe, Mich., manufacturers of alternating current magneto of both high and low tension for stationary, marine and motorcycle engines, reports that it has closed contracts for enough business to keep it running to full capacity for at least a year. This business came very suddenly after a strenuous sales campaign and its volume was so great as to necessitate recalling the entire sales force. E. M. Ford, sales manager of the corporation, advises that the outlook, from a magneto point of view, is very promising.

The majority of this business is for engines of the motorcycle type, although a considerable amount of it is for stationary and marine engines. The officers of the Elkhart Company feel quite pleased at the recognition which this business shows of the superior article that they have been manufacturing for some years past. The Elkhart Company is one of the few magneto manufacturers in the United States which make a specialty of manufacturing absolutely nothing but magnetos, and the foundation of its success is attributed to this specialization.

#### A Satisfied Customer

The Northwestern Motor Co., of Eau Claire, Wis., has received an interesting letter from one of its customers, Albert F. Bixby, Corporal, Company C, Fourteenth Infantry, Haines, Alaska. Inasmuch as the performance of Mr. Bixby's 7 h.p. Northwestern seems to be quite a remarkable one, the letter is reproduced herewith and his boat is shown in one of the accompanying illustrations. The letter follows: "Kindly find inclosed photos of the gas boat Scout, which is 26 feet over all, with a beam of 7 feet. The plank is of 1-inch white oak, dressed. For a boat of this size it is built very heavily. Still, our 7 h.p. Northwestern Giant drives it along at a good speed of 8 miles an hour against all conditions, and the engine compares favorably with any other 10 h.p. machine in this port. I returned to this port on the 14th of October, covering 2,500 miles on the trip. Several different times I ran for twenty hours without a stop. We encountered some mighty heavy going and most of the time had a heavy tow. During the entire trip the engine never missed a stroke. All wearing parts look as good as the day the motor was installed. It is also of interest to you to know that owing to the absence of towns, I was forced to burn most anything I could get. We used gasoline, distillate, naphtha, and even managed to get along successfully on coal oil. The performance of our motor certainly has been a wonderful showing for the efficiency of the Northwestern, and I am heartily

efficiency of the North-western, and I am heartily recommending it to all who are interested in an engine."

#### Government Bulletins

The Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., has just issued two very valuable trade directories. The first of these consists of the revision of the lists of importers and merchants located at Buenos Aires, Bahia Blanca and La Plata, Argentina, and it forms a supplement to the trade directory of South America which was published in 1914, as a section of the new edition of the World Trade Directory. Included also in this supplement is a revised directory for Caracas, together with a recent list for La Guaira, Venezuela.

The other directory is a complete revision and detailed classification of the names of the importers and merchants in Central America and the West Indies. The

## Calendar

January 29-February 6—Motor Boat Show at Grand Central Palace  
February 24-25-26—Florida Midwinter Regatta, Biscayne Bay, Miami.  
June 17—Annual Race, New York to Albany and Return.  
June 24—New York to Block Island.  
July 8—New York to Cornfield Lightship and Return.  
July 15—New York to Ambrose Channel Lightship and Return.  
August 15-16-17—Races for Thousand Islands Championship Challenge Cup, Alexandria Bay.  
September 2-4-5—Gold Cup Races at Detroit.

Sixth St., a full line of Frisbie valve-in-the-head motors will be carried. The store will be under charge of T. T. Burchfield, who will handle the business in this territory.

#### Saint Louis Y. & B. Co.'s Moves

It has just been announced that the Saint Louis Yacht & Boat Co., of St. Louis, Mo., is moving its general offices from St. Louis to 333 Beecher St., Milwaukee, Wis.

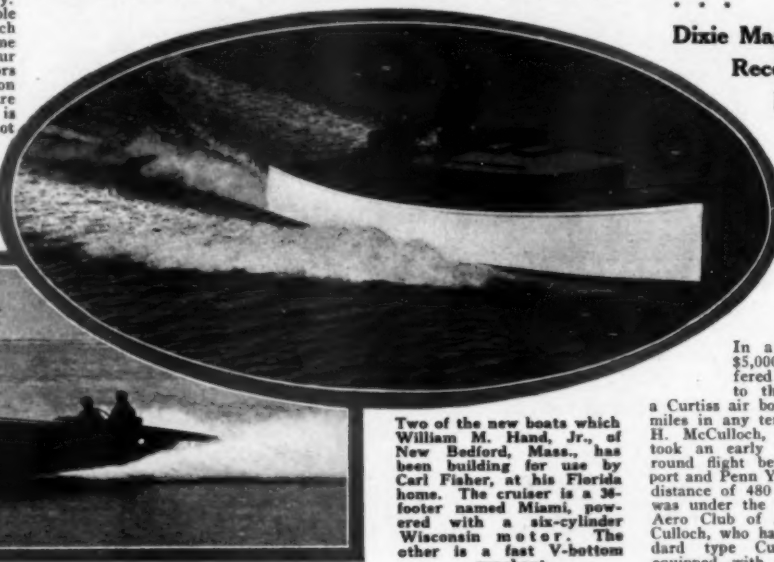
#### Dixie Magneto Makes Record-Breaking Performance

An eight-cylinder Dixie magneto made by the Splitdorf Electrical Co., of Newark, N. J., had a record-breaking demonstration recently under extremely trying conditions.

In a contest for the \$5,000 silver trophy offered by Glenn Curtiss to the aviator owning

a Curtiss air boat flying the most miles in any ten-hour day, David H. McCulloch, of Newport, Pa., took an early lead with a ten-round flight between Hammondsport and Penn Yan, N. Y.—a total distance of 480 miles. The flight was under the supervision of the Aero Club of America, and McCulloch, who had a 100 h.p. standard type Curtiss flying boat equipped with a Dixie eight-cylinder magneto, represented the club in the test, although he flew part of the time against a stiff, dangerous northwest wind, his average speed was 61 m.p.h. Once during the flight the motor suddenly stopped, but was got going again, and it was found on the next landing for fuel and water that the stoppage was caused by a small piece of dirt which clogged the needle valve of the carburetor. The magneto used on this flight was a special eight-cylinder instrument. When it is realized that this faithful magneto delivered its power-giving spark about five million times during the seven hours and forty minutes, the performance of this Dixie seems even more remarkable.

Many interesting experiences occurred to break the monotony of the trip, birds of all kinds on their southward migration being encountered.



Two of the new boats which William M. Hand, Jr., of New Bedford, Mass., has been building for use by Carl Fisher, at his Florida home. The cruiser is a 36-footer named Miami, powered with a six-cylinder Wisconsin motor. The other is a fast V-bottom runabout

lists have been brought up to date and are presented in uniform style with a finding index. This publication, which is published in octavo form, bound in buckram, is sold for 60 cents per copy, and is intended for use by exporters and manufacturers in the United States. The supplement for the South American directory is sold for 5 cents, and both may be obtained on application to the Superintendent of Documents, Government Printing Office, Washington, D. C.

#### Frisbie Opens Philadelphia Agency

The Frisbie Motor Co., of Middletown, Conn., has just opened a store in Philadelphia, where, at 54 N.



One of the attractive Gene V cruisers, built by the Motor, Boat & Supply Co., of Cincinnati, O. In addition to cruisers, this company also builds many other types, including raised-deck cruisers, runabouts, hydroplanes, work boats, etc.



### An Attractive 35-Footer

One of the photographs on page 46 shows the 35-foot size of the famous Gene V raised-deck cruisers built by the Motor, Boat & Auto Supply Co., of Cincinnati, Ohio. Gene V boats are also built in the bridge-deck style with excellent interior arrangements and all modern conveniences in lengths from 26 up to 65 feet. The M., B. & A. S. Co. is also prepared to furnish these boats in the latest and improved form method of semi-erected knock-down frames, which are declared to be quite different from the old style frames. It is also prepared to provide planked hulls and build a complete line of Gene V runabouts and monoplanes, houseboats, work boats and rowboats. Several new designs have been produced for the coming season.

### Knoblock-Heideman Flywheel Magneto

A most interesting announcement has just been made to the effect that the Knoblock-Heideman Mfg. Co., of South Bend, Ind., has perfected a flywheel type of magneto for use on all kinds of internal combustion engines. This concern has been equipping various outboard motor companies with this form of ignition for a couple of years, but it is declared to be a pioneer in supplying flywheel magnetos for other types of marine motors.

One of the principal features of this magneto, which is known as type F, is the coil and breaker construction. This is so designed that there is a separate unit for each cylinder, and if there should be an accident to any coil or breaker, the other cylinders would still keep on firing. A very simple method of shorting the primary winding is provided so that the engine may be stopped at once, or in the case of some two-cycle installations, be reversed on the spark. Only one magnet is used and this is declared to be about twice the length of the ordinary V-shaped type, although the polar gap is approximately the same. The design is such that the magneto delivers a hot spark at very low speeds.

Another feature lies in the fact that an almost unlimited advance and retard is given. In common practice breaker points are adjusted so that they will break when the strongest current is being developed, or at the "peak of the wave." The type F magneto, like the others, breaks the current on the peak of the wave, but the advance or retard position simply means that the wave is generated at that point, so that the breaker always operates at the time of highest electrical efficiency. This magneto has no bearings of its own, but uses the engine bearings. The plates supporting the armature and winding can be carried in a number of ways, but where, as in marine engine practice, an advanced or retarded spark is desired, the plate is best supported by clamping it on an extended part of the shaft bearing. Ample clearance is provided between the stationary and moving parts so that wear on the engine bearing will not affect the magneto, and this clearance or air gap is approximately six times that of the vertical type of magneto. No belts, friction pulleys, gears or trips are used in operating the model F, and in this feature it is truly a built-in type. The design is also such that there are no moving wires, brushes, collectors or distributors. All ground connections are riveted and made permanent. The coils are thoroughly impregnated with a damp-resisting material and are placed in water-proof tubes of the interstices which are filled with a compound that is heat-resisting and water-proof.



The McFarland & Spilker offset strut

### Missouri Oil Engines

Although manufacturing a complete line of gasoline engines from 4 to 125 h.p., the Missouri Engine Co., of 2806 North 11th street, St. Louis, Mo., is just now centering its attention on its four oil engines, which are designed to burn kerosene, fuel oil or crude oil. The increasing cost of gasoline has caused more orders for this style of motor than at any time in the Missouri Company's history, and it announces that it is making every effort to supply the demand. These oil engines are made in one cylinder size—5 x 6-inch bore and stroke—and one, two, three and four cylinders, developing 7 to 30 h.p. One of the chief features of these motors is the oiling system, which is so designed as to deliver the proper amount of lubricant to all the bearings without waste. The motors are not equipped with

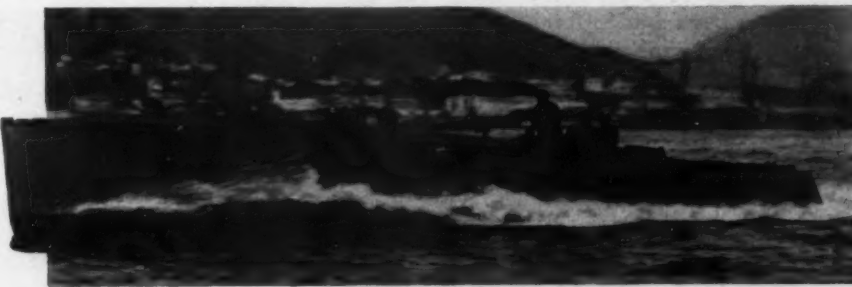


The new boat factory owned by the Albany Boat Corporation, formerly the Hacker Boat Co., of Albany, N. Y. This building is located at Watervliet, and occupies three-quarters of an acre floor space

carbureters, nor with any electrical equipment, as ignition is taken care of by the hot bulb system. When cold the engine may be started, it is declared, in from two to six minutes, a hot torch being directed against the starting tube, and it is stated that when started it will continue to run perfectly regardless of weather conditions for as long as fuel is fed to the cylinders. The chief points which the manufacturing company emphasizes in regard to these motors are the low cost of fuel, freedom from trouble, long life and absence of electrical difficulties.

### Smalley Engines for 1916

After manufacturing two-cycle engines for twenty years, the Smalley-General Co., of Bay City, Mich.,



One of the fast 53-foot patrol boats built at Genoa for the Italian navy. These 30-mile boats are powered with the new Model F Sterling eight-cylinder engine

has now decided to make a leader of its MBB 12-15 h.p. two-cylinder engine. By making this particular model in great quantities, the company has been able to reduce the price to \$150. The company, it is declared, has already booked more than enough orders to insure the success of this big undertaking. The engine in question is a two-cylinder, 4½ x 4½-inch machine. It is equipped with a perfected non-back-firing device, flanged flywheel, exhaust manifold with water connections, etc. Each engine carries a guarantee on fuel economy and flexibility. Although the MBB engine is to be the leader, the company still continues to manufacture its usual complete line ranging from 2 to 250 h.p.

### Harbeck Model Sells Like Hot Cakes

The Loew-Victor Engine Co., of Chicago, Ill., states that it is already busily engaged in turning out

some of the new high-speed Harbeck Model engines, which were announced but a short time ago, and which will power some extremely fast runabouts and express cruisers new building. A few of the installations are as follows: One pair of six-cylinder, 200 to 300 h.p. machines for a 56 x 6-foot 9-inch runabout, now building at the yards of Mathis Yacht Building Co., of Camden, N. J., for Livingston L. Biddle, of Philadelphia. This boat was designed by Bowes & Mower, of Philadelphia, and from model tests made in the experimental basin at the Washington Navy Yard, it certainly should prove to be extremely fast. Another pair of these engines will be installed in a 72-foot express cruiser, also designed by Bowes & Mower, which will be built this winter for a Mr. Sellers, of Philadelphia. John Kelley Robinson, of the New York and Larchmont Yacht Clubs, has placed his order with the Luders Marine Construction Co., of Stamford, Conn., for a 55-foot express cruiser with a guaranteed speed of 25 miles. This flyer will also be powered with one of the new six-cylinder 200 to 300 h.p. Harbecks.

### Bosch Magnetos

The Bosch Magneto Co., of New York City, has just signed contracts with two very prominent concerns in the motor boat field to use Bosch magnetos for the coming season. They are the Ferro Machine & Foundry Co., of Cleveland, O., and the Campbell Motor Mfg. Co., of Minneapolis, Minn. This, we understand, makes 176 actual contracts for the exclusive use of Bosch magnetos obtained during the past season.

### Italian Firm Buys Berlings

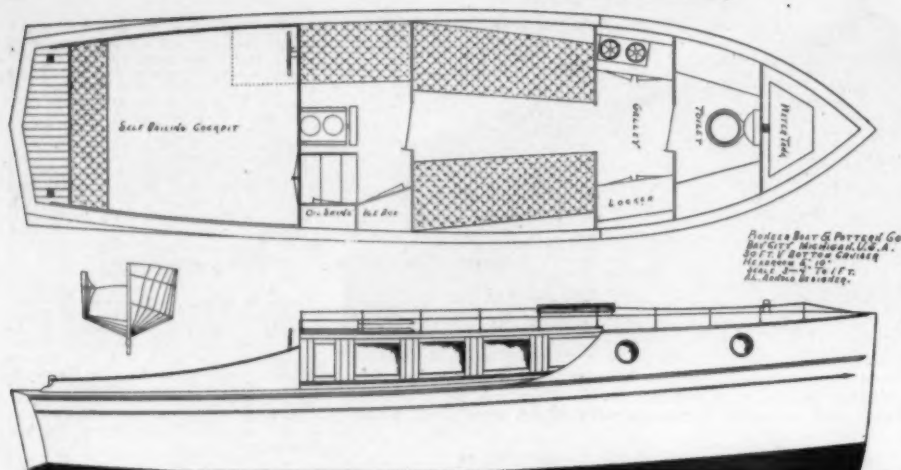
A contract running into thousands of machines has

just been placed with the Ericsson Mfg. Co., of Buffalo, N. Y., for its Berling magnetos by the F. I. A. T. Automobile Co., of Torino, Italy. The present requirements call partly for the type B four-cylinder magnetos, and partly for the N-44 type four-cylinder instruments. This B-41, which constitutes a large part of the order, is of independent high tension type. Like the score or more different types of Berling magnetos, it has the same virtues of versatility, rapidity of action, rigidity and accessibility of construction.

Probably the reason why the Berling was chosen by one of the greatest of European automobile manufacturers lies in the fact that the Berlings have made such a wonderful record, not only in Italy, but elsewhere abroad, on the Curtiss aeroplanes. They have also proved their worth on the mammoth 200 h.p. eight-cylinder Sterling engines, which have been furnished for the 35-mile-an-hour motor boats recently adopted by the Italian navy.



Wakemup, a 32-foot cruiser powered with a Series B4 Scripps motor. She is owned by Lester N. McDonald, of Duluth and Virginia, Minn.



Plans of a 35 x 9-foot heavily constructed fishing boat which is furnished complete or in K-D by the Pioneer Boat & Pattern Co., of Bay City, Mich. This boat draws three feet of water, and may be powered with either a 20 or a 30 h.p. heavy-duty motor

### Bill Kaiser Joins Sumter

The announcement has just been made that W. L. Kaiser, more familiarly known as Bill Kaiser, and for many years the popular representative of the Hercules Electric Co., has joined the sales force of the Sumter Electric Co., of Chicago, Ill. His many friends in the industry wish him all success in his new connection.

### Van Blerck Organization As Changed By Recapitalization

The recapitalization of the Van Blerck Motor Co., of Monroe, Mich., and the tremendous additions meant the plant now being completed have naturally meant an enlargement of the personnel of the organization, and it is of interest to note hereunder the various executive officers and departmental heads.

Joseph Van Blerck, president of the company, is also its chief engineer and he devotes his entire time and energies to designing new motors and keeping the present models strictly up-to-date. Mr. Van Blerck takes frequent trips to the larger boating centers and spends a great deal of his time on boats in which Van Blerck motors are installed, so that he can see for himself just how the motors do their work in actual service and so that he can design and build his motors to render the highest possible efficiency after they are installed in a boat.

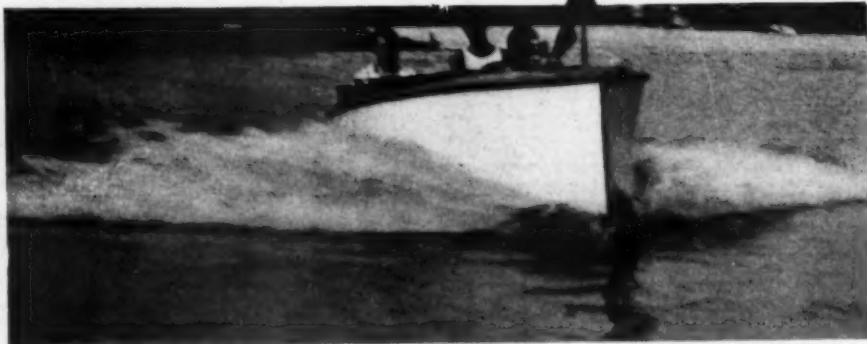
Charles B. Page, vice-president and treasurer of the company, is in reality general manager, as it devolves on him to advise and supervise the various departments. Mr. Page's unique executive abilities have been given wide scope in the rapid building up of the factory and organization that has characterized the growth of the Van Blerck Motor Co. during the past three years and especially during the past year.

Clifton M. Kolb, secretary of the company, was until recently prosecuting attorney for Monroe County, Mich., and is a well-known, capable lawyer. Mr. Kolb gave up his legal work to accept his position with the company recently

and he now devotes his entire time to its work, devoting his time to the accounting end of the business and assisting Mr. Page in much of his executive work.

Rex W. Wadman, general sales manager, is well known to the industry, having been connected with it in prominent positions for many years. Until recently, Mr. Wadman handled the details of the ad-

vertising department, marine department and commercial department, but the business has grown so tremendously during the past few months that it has been found necessary to appoint managers for the marine and commercial sales departments, and leave Mr. Wadman free to concentrate on the advertising department and act in an advisory manner towards the other two departments.



A 23 x 5-foot Hand V-bottom runabout owned by F. Amonn, of Montreal, Quebec. She is equipped with a 16-20 h.p. Buffalo Automarine, and makes 16 to 17 m.p.h.

F. B. Sexton, marine sales manager, is a new addition, having been brought from Portland, Ore., to take this position. Mr. Sexton has been connected with the gas engine business on the Pacific Coast since its infancy. He introduced the Van Blerck on the Pacific Coast and has been its representative there for the past three years.

W. A. Peddle, commercial sales manager, is also a new addition to the organization, having been brought from New York. The commercial department of the company has grown so large that it needed the complete attention of one man who was an experienced engineer, as most of the sales were for centrifugal pumping outfits, electric generating sets, irrigation outfits, etc.

L. J. Maurer, service manager, has been with the company for several years. He knows the Van Blerck motor piece by piece and part by part. He is a diplomat and his one desire is to keep a customer satisfied after his engine reaches him. Van Blerck users have found Mr. Maurer to be a mighty fine fellow to do business with.

J. A. Masterman, production manager, is declared

to have had a herculean task to accomplish during the past year—that of increasing production on the same ratio as the sales department increased sales; that he has been successful is a distinct credit to him.

L. Leitner, head of the drafting room, is a product of Detroit's largest automobile factories and is considered a wizard on technical data. He has proved himself to be a very valuable aide to Mr. Van Blerck in the designing and perfecting of details on the Van Blerck engines.

W. W. Tuttle, factory engineer, is a recent graduate of the University of Michigan in technical lines, especially the design of automobile engines. Mr. Tuttle attends to requirements of the sales department for special equipment on engines, special drawings, etc.

### McFarland & Spilker Offset Strut

The offset strut illustrated on page 47 has grown to be one of the most popular articles made by the McFarland & Spilker Mfg. Co., of Cincinnati, O. This appliance is carefully designed and constructed with the express idea of making it the best of its kind. It is adapted for boats of the fast runabout type, but, it is declared, it will give equal satisfaction on almost any type of boat requiring this kind of strut. The keel plate and vertical arm are in the form of an L, the self-aligning shaft bearing swiveling on a recessed joint in this arm. The bearings are made of manganese bronze, reamed to standard shaft sizes. They are extra long to give good service, but may be easily removed and replaced when worn. This company is also making a new type of stern strut and rudder for speed boats with plumb stern.

### Wakemup

This boat is a 1915 cruiser owned by Lester N. McDonald, of Duluth and Virginia, Minn., who uses it on the waters of Vermilion Lake, near his home. Wakemup is of the popular day cruiser type and is 32 feet long by a beam 7½ feet and



A 31-foot Sterling - powered boat used by the Government in Anchorage, Alaska

2 feet 4 inches draft. The power plant consists of a 30 h.p. four-cylinder 4½ by 5-inch Series B Scripps motor, turning a 20 x 22-inch three-bladed wheel. The engine is placed under the forward hatch with all controls brought to the bulkhead separating the forward cabin from the cockpit. Aft of the cockpit, as may be seen from the illustration on page 47, is a roomy glass windowed cabin. This contains two cushioned side seats, locker and toilet. There is an after-deck for the handling of lines.

### A New 30-Mile Runabout

What is declared to be one of the fastest monoplanes runabouts produced for the 1916 season is a 24-footer built by A. G. Liggett, of Motor Boat Club Lane, Detroit, Mich., who has been building V-bottom runabouts for the last five years. This boat has a beam of 6 feet and is constructed with keel and chine of solid white oak, shaped and rabbeted to take the plank n.g.



A fast 24-foot runabout built by A. G. Liggett, of Detroit, Mich. Powered with an old model Scripps motor, this boat in her trial trips covered the mile time and again at a 30-mile rate





frames of 2 1/4 x 3/4-inch white oak, spaced 1 foot apart and bolted together at the chine and keel. The planking is of white pine on the bottom with white cedar on the sides and with 3/4 x 1 1/4-inch oak battens under the seams securely clinch-nailed to both frame and planking. The deck is of white pine, canvas covered, with a large brass-bound hatch covering the motor. There is an oval mahogany stern transom and all interior finish is in mahogany. The equipment is complete, comprising electric lights, life preservers, flag poles, chairs, anchor lines and boat hook. Fitted with a Model HB semi-speed Scripps motor with electric starter, this boat is sold for \$1,400, with a guaranteed speed of 23 m.p.h.; equipped with a 1915 Morton motor with rear starter the boat will obtain a speed of 15 m.p.h., and is sold for \$850.

It is interesting to note that when equipped with an old Model G Scripps motor, turning a 19 x 32-inch B. & B. propeller at about 1,000 r.p.m., this little runabout covered a measured mile time and again at the rate of 30 m.p.h. The builder declares that he tried her in a 40-mile blow and that she lifted to the seas, was extremely dry, and handled perfectly.

### Motor Craft At Anchorage, Alaska

Up above the sixtieth parallel in the territory of Alaska the United States Government is constructing a railroad linking together the port of Seward and the Yukon country in the interior. This wonderful railroad passes through Knik, or Anchorage, as it is now called, situated on an arm of Cook Inlet, some 110 miles from Seward. Here the Alaska Engineering Commission, in charge of the construction, have a couple of motor craft which they find of great value to them in the work. These boats are powered with Sterling engines, manufactured by the Sterling Engine Co., of Buffalo, N. Y.

One of these boats with her Sterling power plant has recently arrived at Anchorage and may be seen in the illustration on page 48, taken at that port. A good idea of the character of the water and land in this remote locality may be had from this picture. The boat is 31 feet long by 5 feet 6 inches beam. She is fitted with a removable iron skeg, which is used or not according to the requirements of the

in the hands of salesmen to prevent misfit outfits.

"In adding this department," Secretary H. E. Brate, of Lakemont, N. Y., said recently, "we have no idea of conflicting in any way with the National Association of Engine and Boat Manufacturers, but to give to marine engine manufacturers, a number of whom are already members of the N. G. E. A., accurate data which they greatly need, and which they have requested us to gather and publish for them. We already have the organization for getting out these data-sheets. Messrs. Fisher, Nablo and Anderson will direct the work of this department."

### Overcoming River Difficulties

The Guadalupe River in Texas is full of a very foul and thick growth of surface and submerged vegetation, obstructing transportation to such an extent that it is utterly impossible to operate a boat with a propeller. To overcome this difficulty, Joseph Landa, of New Braunfels, Texas, has constructed a boat 36 feet long, 7 feet wide at the bow and stern, 12 feet 8 inches wide in the center and 26 inches deep. Through the Walter Tips Co., of Austin, Texas, he has purchased a six-cylinder Ferro four-cycle all-enclosed engine to be used in this boat. It will be set in a horizontal position across the boat to connect with a chain drive to a sub-



An attractive 31-foot cruiser built by the Saint Louis Yacht & Boat Co., of St. Louis, Mo. Several boats of this model have been shipped to the War Department for use out of Galveston, Tex.

mated that the speed of the boat will not exceed four miles an hour while cleaning the river, but that when the boat is not used for this purpose, it will be used as a passenger ferry. This is not entirely a new idea, as Mr. Landa has used the same system in the past in a boat which was propelled by an upright steam engine and boiler. But the power of this engine was sometimes insufficient to drive the boat through the thick vegetation, so he is building a new boat and equipping it with a modern four-cycle engine developing 35 to 50 h.p.

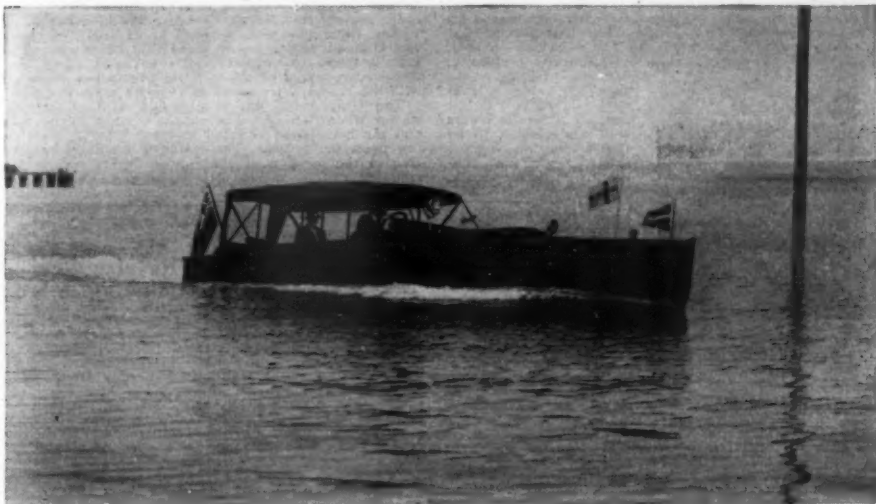
### A Seaworthy 31-Foot Cruiser

In response to an increasing demand for a small, fast seaworthy cruiser with comfortable cabin accommodations, with full headroom for four people, the Saint Louis Yacht & Boat Co., of St. Louis, Mo., has produced a stock model 31-foot modified V-bottom hunting cabin cruiser, which meets these requirements admirably and which is considered one of the most satisfactory and attractive boats of this class yet produced.

The accompanying illustration is of one of these models shipped in December to the U. S. War Department for use out of Galveston, Tex., the picture having been taken during the trial run of the boat prior to shipment at the works of the builders.

These boats have a large clothes locker forward with a main cabin equipped with two extension berths with lockers under, adjoining which is a galley with stove, sink, refrigerator and larder, and a fully equipped lavatory, all with six-foot headroom. The after end of the boat is given up to attractive self-bailing cockpit 14 feet long and 6 feet 6 inches wide, accommodating ten to twelve persons. The motor, a four-cylinder 60 h.p. medium-duty machine, is installed under the bridge in the forward end of the cockpit, where it is fully protected and is yet accessible. The controls are all carried to a steering column on the port side of the cockpit forward. The entire cockpit is protected by an attractive awning with side curtains, enclosing it completely when desired. The switchboard controlling the cabin lights and the running lights, anchor light and searchlight is located on the forward side of the main cabin bulkhead.

These boats are heavily constructed and are salt water fastened and equipped throughout. The lines are most graceful and, considering the substantial construction and size of the boat the speed secured, 17 m.p.h., is thought remarkable. These models have a very low center of gravity with ample freeboard, are excellent sea boats and are operated with the



Migrace, a 30-foot runabout owned by Rear Commodore James F. Cripps. Prefix an S to his name and you will have the name of his highly successful power plant

moment. With the skeg the boat draws 31 inches, while without it her draft is but 25 inches. This skeg naturally also affects her speed quite materially, the boat making 23 m.p.h. without it, and 19 m.p.h. with the iron protection attached.

The engine providing this boat with so good a speed is the small but powerful four-cylinder, 4 1/4 x 5 1/2-inch Sterling high-speed motor. It was installed by the Atlas Gas Engine Agency, of Seattle, Wash., Sterling distributors, before the outfit was shipped to Alaska.

### Dixie In Tractor Service

It is interesting to note that the Dixie magneto, extensively in service on American and European automobiles and motor boats, has now reached out to the tractor industry. The Sumter Electrical Co., of Chicago, Ill., the exclusive distributors of the Dixie line in the stationary, tractor and marine fields, reports five prominent tractor concerns as having covered its ignition requirements for the year 1916 by contract for this popular magneto.

### N. G. E. A. Organizes Marine Department

The National Gas Engine Association has recently organized a Marine Engine Department, which will be under the supervision of the following well-known marine engine manufacturers: O. H. Fisher, president of the Union Gas Engine Co., San Francisco, Cal.; Grant H. Nablo, sales manager of the Gray Motor Co., of Detroit, Mich., and Wm. C. Anderson, of the Anderson Motor Co., of Chicago, Ill.

The addition of this department means that the marine engine manufacturer will have his special requirements attended to just as the stationary engine and tractor manufacturers are now being taken care of by the N. G. E. A. Among the first things to be taken up by the association is the issuing of data-sheets covering marine engines and boats. These data-sheets, which will be known as Vol. VIII, will cover every type of motor, giving the power necessary for the various types of boats, lengths, size of propellers and types, ignition systems, installations and equipment in general, and they are designed to be placed

merged cutter-bar in front, which is very similar to the kind used on an ordinary mowing machine. This cutter-bar is raised and lowered with ratchets and pinions to meet the depth of the stream, cutting approximately four to six feet under water. The engine will also connect with a chain drive to a paddle wheel propeller in the rear of the boat. It is esti-



Annual distributors' convention of the Bosch Magneto Co., held recently in this company's New York office. The convention wound up with a trip to the Bosch plant at Springfield, Mass.

same simplicity and ease as a modern motor car. It is declared that this new Saint Louis boat was selected by the War Department for use out of Galveston because of its speed and seaworthiness and because its modified V-bottom makes it available also for use in very shallow water.

One of these models is now building in the works of the Saint Louis Co. for W. G. Selby, of Marietta, O., who will use his boat at Tampa, Fla., for fishing.

### Thorobreds In Foreign Lands

The Red Wing Motor Co., of Red Wing, Minn., announces that a Model F Thorobred motor for the launch of the Harbor Master has just been shipped to Gibraltar, Spain, at which port other Thorobreds are already doing regular service. A Model F has also been shipped to Buenos Aires, Argentina, where it will go into a 21-foot hydro, a duplicate of the famous Fleetwing, of Auckland, N. Z., which, with her 28 h.p. Thorobred, has defeated speed boats of twice and three times her power.

### The Model D-Jr. Gray

Some interesting facts have come to light regarding the Model D-Jr. Gray motor, which was announced in this department last month. It appears that following the introduction of the Model D last year the Gray Motor Co., of Detroit, Mich., was importuned by salesmen and customers alike for a similar motor of smaller size. This demand became so insistent that the Gray Company decided to design and produce in large quantities a motor in two and four-cylinder sizes, rated at 5-6 and 10-12 h.p., respectively. As the combination of quality and value is best obtained by quantity production, this company has always directed its operations toward the type of engine which affords a large market.

It was at first thought that the new motor could be made an exact duplicate of the Model D, but after the idea had been worked out to a certain extent, it was discovered that the D design would become an expensive manufacturing proposition and it was, therefore, discarded. The design eventually worked out, it is said, gives the greatest possible power, least weight, and extreme compactness combined with the lowest possible cost of manufacture.

The Model D-Jr., by the way, is designed to accommodate an electric starter if desired, or an elevated rear starter. The most prominent feature is in the oiling system, which is of the positive pressure



A 25-foot runabout of very pleasing lines built by G. R. Richardson, of North Tonawanda. She is shown on the ways preparatory to hauling out

type with the crankshaft drilled laterally through webs and bearings so that the oil is distributed from the forward end bearing to each connecting rod bearing and then to the rear main bearing. As explained in another section of this issue, this model is being exhibited at the New York Show, and it is said that orders are already being booked for early spring deliveries. Considerable new equipment has been installed by the Gray Motor Co. to take care of quantity production.

### Many Sterlings In New Zealand

The New Zealand Yachtsman of October 30 observed that many owners of that country are putting Sterling engines in their boats. The news notes follow: "Messrs. Bailey & Lowe's yards at Sulphur Beach, Northcote, present a very busy appearance, work of all descriptions being plentiful. Just completed is a 32 x 8-foot launch fitted with a 25 h.p., four-cylinder Sterling engine (firm agents). This boat has a 7-foot cabin and a large cockpit, and was built to the order of Mr. Grace, of the Thames. She was delivered to her owner during the week. The 36 x 9-foot counter-stern launch for A Chee is well in hand. The hull is now completed and work is now proceeding in the cabin and engine-room. She is expected to take the water in about two weeks' time. During the week a start was made on a 32 x 8-foot 4-inch diagonal-built launch for the Thames River trade. She will be fitted with a 35-55 h.p., four-cylinder medium-duty Sterling engine, and will have accommodations for seventy passengers. A further order has also been placed for a launch similar to the one supplied to Mr. Grace, of the Thames. Her motive power will be a 12-15 h.p. Sterling Fisherman engine. Last week the firm forwarded a 14-foot boat to the East Coast, a 12-15 h.p. two-cylinder, Sterling Fisherman engine to Pictou, a 17-25 h.p. Sterling to Brisbane, and a 20-35 h.p. medium-duty Sterling to the Manukau."

### The Pride of Digby Basin

When Rear Commodore James F. Cripps, of the Western Nova Scotia Y. C., of Digby, N. S., decided to have a new boat last spring, he made up his mind that he would have the best in the fleet. He therefore went to Wm. H. Hand, Jr., of New Bedford, Mass., and secured plans for his design No. 268, a 30 x 50-foot 7-inch V-bottom runabout. Then he went to Evan E. Dunn, of Digby, and had the boat constructed. For power he prefixed an "S" to his surname and installed a four-cylinder Series B Scripps. This engine, while of only moderate power, drives Migrace at a

speed of 18 real miles per hour, and as this was fast enough all summer to clean up every Digby boat as well as visiting craft, Commodore Cripps is entirely satisfied with his outfit.

Migrace is built of white cedar, with mahogany upper works. Valspar is used for finishing, and the boat has a splendid appearance.

Digby Basin, the home waters of the Western Nova Scotia Y. C., is a magnificent body of salt water, and conditions here are ideal for motor boating.

Commodore Cripps has made several long trips in Migrace, among them a run to St. John, N. B., and one to Eastport, Me.

### A Saint Louis 30-Footer

The Saint Louis Yacht & Boat Co., of St. Louis, Mo., has developed a 30-foot displacement runabout which, in point of design, construction, equipment, finish and performance is one of the finest boats of its class built in this country. It comfortably seats 10 people, is dry and fast for the power installed, handles quite as easily as does a modern motor car, and is especially suitable for Great Lakes and Southern use.

The regular equipment is a four-cylinder 5½ x 6¾-inch engine of the highest grade with two-unit electric starting and lighting outfit, automobile steering gear with left hand drive and center control. The front seat accommodates three persons, being divided to facilitate moving about at will in the cockpit, which is equipped with a permanent stern seat and four special wicker chairs. The boat is salt water fastened throughout, and is finished in white enamel and paneled mahogany, and the seats are upholstered in genuine leather over springs. The boat is equipped with water-tight bulkheads to make it non-sinkable, and with patented built-in

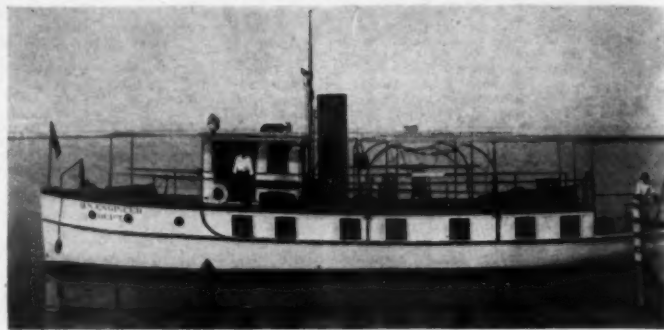
disappearing windshield, one-man folding auto type top, electric running and cockpit lights, and all the refinements and conveniences to be found on the highest grade marine runabout. These boats, which have been standardized, are built as stock models, and are offered complete ready to run at attractive prices.

### The Richardson 25-Footer

R. G. Richardson, of Sweeney street, North Tonawanda, N. Y., is making a specialty of a 25-foot stock runabout having a beam of 5 feet 10 inches. This will be sold with or without motor. A boat of equal length, although having a beam of 6 feet, has just been sold to Fred. Davison, of Buffalo, N. Y., equipped with a four-cylinder 5 x 6-inch Peerless motor and self-starter.

### Koban Has Inboard Motor

The Koban Mfg. Co., of Milwaukee, Wis., makers of the original Koban two-cylinder outboard motor, will now exploit a 3 h.p. two-cylinder inboard motor. The special features are as follows: Freedom from vibration, because of the opposed cylinders firing simultaneously, thus absorbing the shock; unusual compactness, requiring less room than most single-cylinder types of less horsepower; unusually light weight, with great power and speed. The motor will be distinctive as to its size, weight and power.



Neuse, used by the U. S. Engineer Department in its work on the new breakwater at Cape Lookout. She is 62 feet in length and is powered with a Sterling 70 h.p. motor

### The Model C Universal

The Model C Universal marine motors which have recently been brought out by the Universal Motor Co., of Oshkosh, Wis., are declared to be meeting with exceptional favor throughout the country owing to the many attractive features embodied therein. Not only is the motor designed and built to operate absolutely smoothly and quietly, but it has demonstrated its capacity to run continually for extremely long periods without the least trouble or attention, it is said. The new features incorporated in the Model C motor are increased capacity by the increased cylinder size to 2½ x 4 inches, new positive flexible magneto coupling, hand hole plate in base, removable oil pump, adjustable valve tappets, taper key and nut flywheel fit, felt washers throughout to prevent oil leaks from the motor, reverse gear completely enclosed, rear, front or electric starter, magneto or Unisparker ignition, flexible propeller coupling and ball thrust bearing.

In testing the Model C motor last summer in a 16-foot speed runabout, a speed of 21 miles per hour was attained with a motor speed of 1,700 r.p.m. The normal speed in ordinary boats is 1,200 r.p.m. and the average speed of 20 to 24-foot launches equipped with the Model C Universal is 10 to 14 miles per hour.

The Universal motor is provided with an electric starter when desired. The weight is only 300 pounds and the horsepower is rated at from 9 to 12, depending upon the speed. The speed is instantly responsive to the position of the control levers, which are mounted conveniently at the cylinders. A Joe's reverse gear with multiple disc clutch and hardened gears is used and the magneto is of the Berling type, which can be provided with starting coil when desired to start on battery.

### Michigan Builds New Reverse Gear

The Michigan Wheel Co., of Grand Rapids, Mich., is just getting out a new reverse gear which is declared to have a number of advantages over the ordinary type of marine gear. The reverse band mechanism is of very powerful construction, and another feature is that the entire motor power on the forward drive is transmitted directly from motor shaft to propeller shaft through a set of frictional discs. The discs are so located that the amount of friction surface and direct line pressure is very great, while this method of construction saves the pinion gears from breakage by sudden or continuous jars.

### Great Lakes Boat Bldg. Corp. Formed

It has just been announced that a syndicate of St. Louis business men headed by Judson H. Boughton and W. C. Morehead, who will take active charge of the business, has formed the Great Lakes Boat Building Corporation with a paid up capital of \$120,000 and has taken over the Saint Louis Yacht & Boat Co., in which the organizers were largely interested and the Milwaukee Yacht & Boat Co. On February 1, the new concern will begin active construction of boats of all sizes and types up to 200 feet in length at the plant of the old Milwaukee Co., which is one of the most modern and looked for from the amalgamation of these two best equipped in the country. Big things may be important midwestern concerns.



A 30-foot Saint Louis runabout which is high-class in design, construction and equipment



# MOTOR BOATING ADVERTISING INDEX

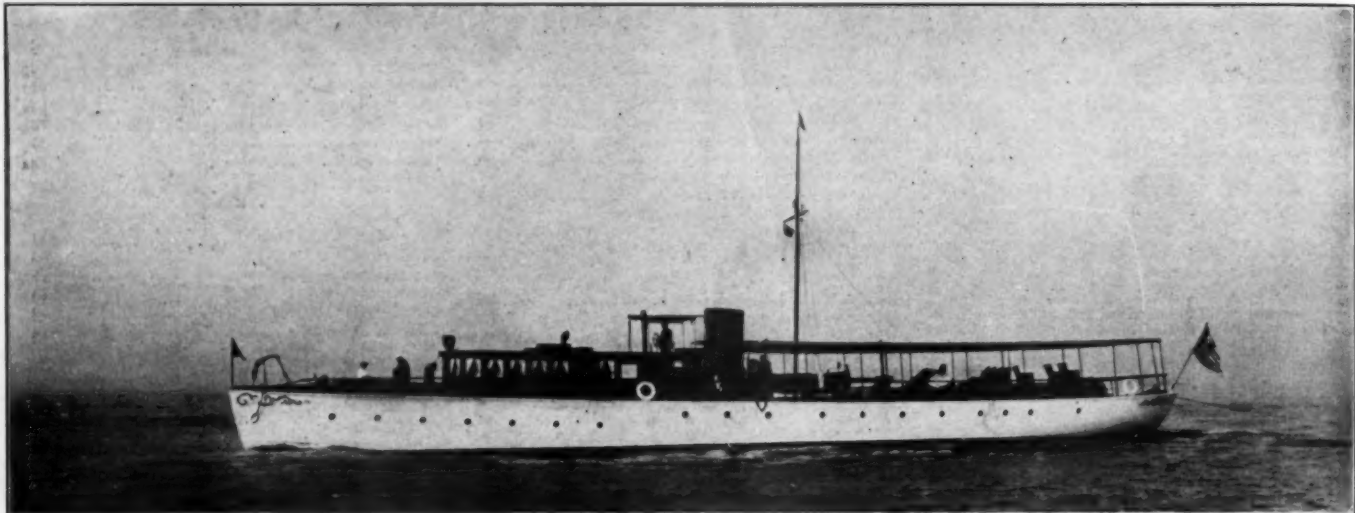
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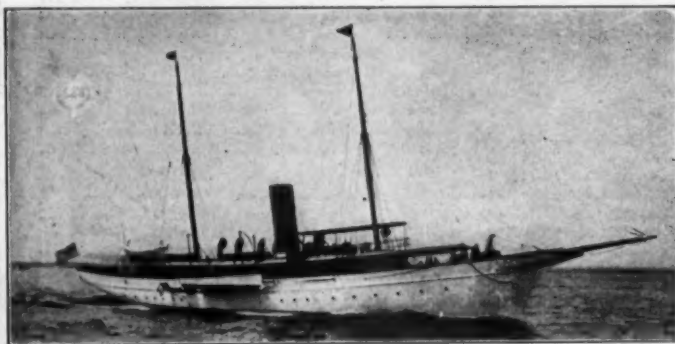
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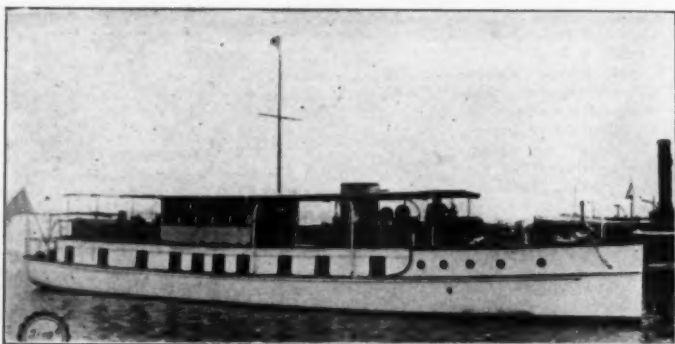
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request. Catalogue illustrating types and sizes of yachts we have for sale will be mailed on application.



No. 885.—For Sale or Charter.—Handsome fast 120 ft. twin screw, steel power yacht. Speed up to 18 miles. Large dining saloon on deck, three double staterooms, main saloon, two bathrooms, etc. Price attractive. Cox & Stevens, 15 William St., New York.



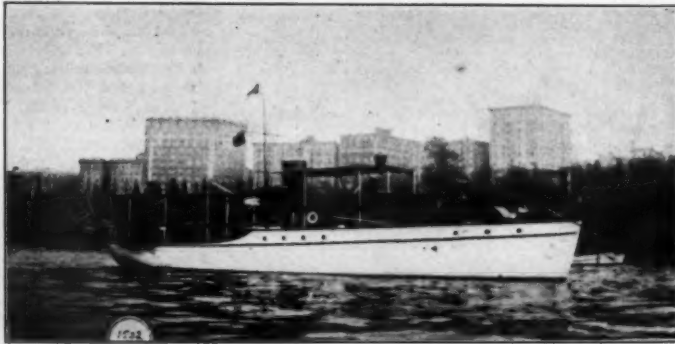
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No. 2100.—For Sale or Charter.—Modern twin screw gasoline houseboat; 95 x 19 x 3.3 feet. Speed 13-14 miles; two 100 h.p. motors. Large social hall on deck. Dining saloon, four double staterooms, bath, etc. Very desirable craft. Cox & Stevens, 15 William St., New York.



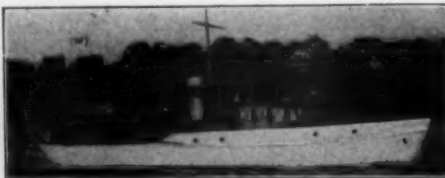
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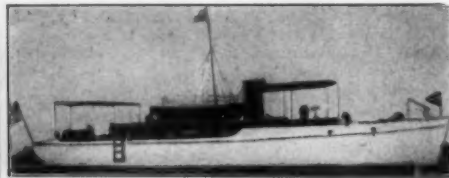
No. 1532.—For Sale or Charter.—Very desirable twin screw power yacht; 75 x 13.6 x 4 ft. Speed 12-14 miles. Recent build. Dining saloon and galley forward; three staterooms, bath, etc., aft. Price attractive. Cox & Stevens, 15 William Street, New York.



No. 1744.—For Sale.—Attractive twin screw gasoline cruiser; 67.6 x 13.6 x 4 ft. Highest grade construction by well known firm. Speed 11-12 miles. Standard motors. Dining saloon and galley forward; two double staterooms and bath aft. Price low. Cox & Stevens, 15 William St., New York.



No. 1937.—For Sale at Low Figure.—Modern gasoline cruiser; 65 x 12 x 3.9 ft. Built 1912. Speed 12 miles. Substantially constructed—handsomely finished. Large saloon forward of engine room and galley; main saloon, double stateroom and bathroom aft. Special opportunity. Cox & Stevens, 15 William Street, New York.



No. 1467.—For Sale.—Lawley built bridge deck cruiser, 53 x 11 x 3.6 ft.; speed, 12 miles; best craft of type and size available; now in commission in Florida; price attractive. Cox & Stevens, 15 William Street, New York.

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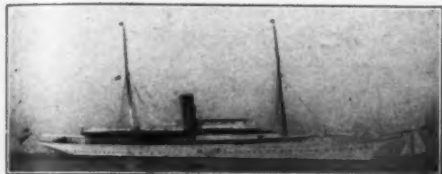
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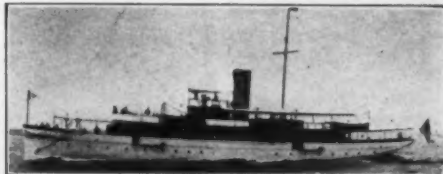
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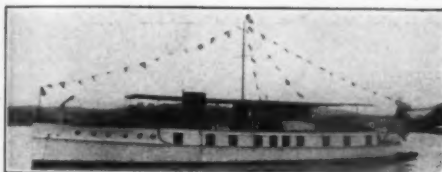
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8164.—177-foot Steel Twin Screw Sea Cruiser. Moderate draught. Unusual accommodations. Speed 15 knots. Best finish and appointments.



8001.—105-foot Twin Screw. 4 staterooms. 2 baths. Standard motors. Speed 21 miles.



7744.—95-foot Twin Screw Ideal American Cruiser. 3 ft. 3 in. draught. 4 staterooms. 2 baths. Speed 14 miles. Hot water heat. Perfect condition.



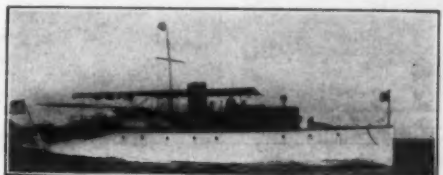
8218.—110-foot Twin Screw Cruiser. 22.2 beam. 4 draught. Exceptionally able. Speed 12 knots.



7920.—94-foot Seagoing Cruiser. 300 h.p. Standard motor. Every convenience; 3 staterooms.



7820.—75-foot Twin Screw Coast Cruiser. 3 staterooms. All conveniences.



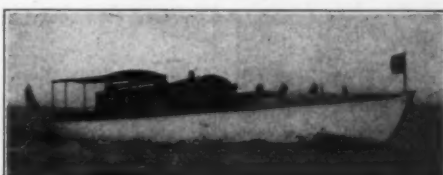
8103.—71-foot Twin Screw. Built by Lunders 1912. 2 staterooms. Bath. Speed 13 miles.



8084.—64-foot Lawley Cruiser. 3 1/4-foot draught. 4 staterooms. Standard motor. Electric lights. Cruised entire Atlantic Coast. Now in Florida.



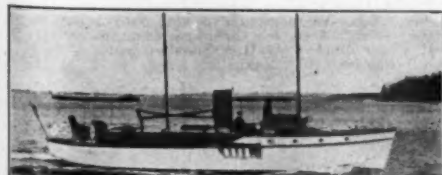
8133.—55-foot Cruiser. Double stateroom. Saloon. 2 toilets. Beautiful condition.



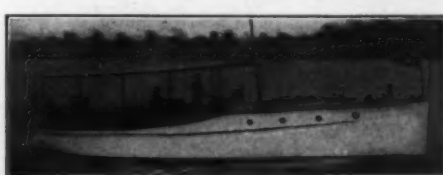
8219.—54-foot Elco Cruiser. Speed 16 miles.



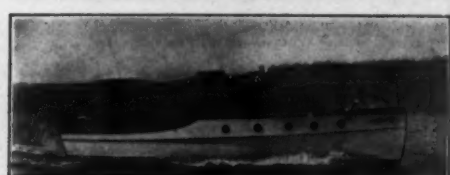
8045.—53 x 11 1/4 x 3 1/4. Very heavily constructed; bottom copper sheathed; large stateroom and saloon; mahogany finish; 50 h.p. 6-cylinder Standard. Built for ocean cruising. Offered by estate.



8024.—50 x 10 1/4 x 3 1/4. 2 staterooms; 25 Standard.



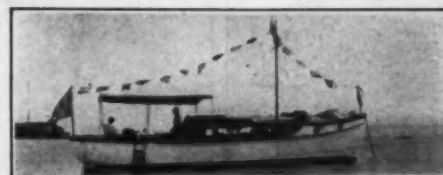
8125.—45x10.7x3. Elco Cruiser. Launched 1914. Stateroom, saloon, two toilets. 25 h.p. Standard motor.



7903.—40x9.2x3.4. Launched 1913. Stateroom, saloon 45 h.p. Fay & Bowen engine. Speed, 12 miles.



8214.—40-foot Cruiser. Stateroom. Very able boat.



8092.—36 x 9 x 2 1/4. Palmer Cruiser. Launched 1912. Stateroom. Saloon. 20 h.p., 4-cycle engine.



7995.—32 1/4 x 7 1/4 x 2.2. Express Cruiser. Launched 1915. 65 h.p. Van Blerck engine. Speed 19 miles per hour. In commission. Florida.

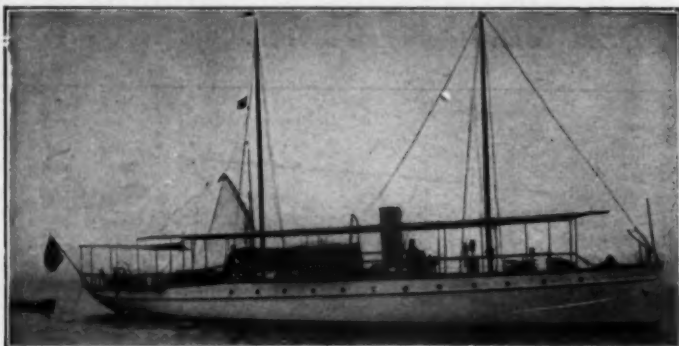
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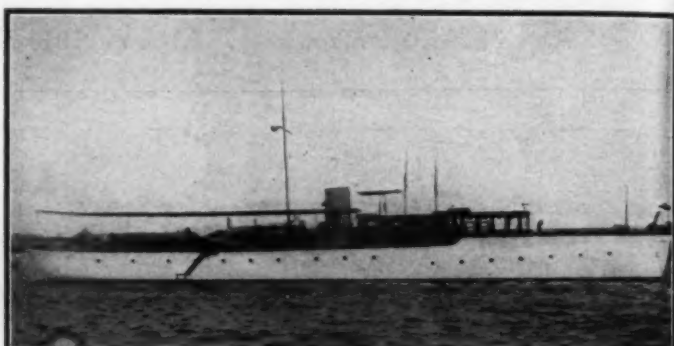
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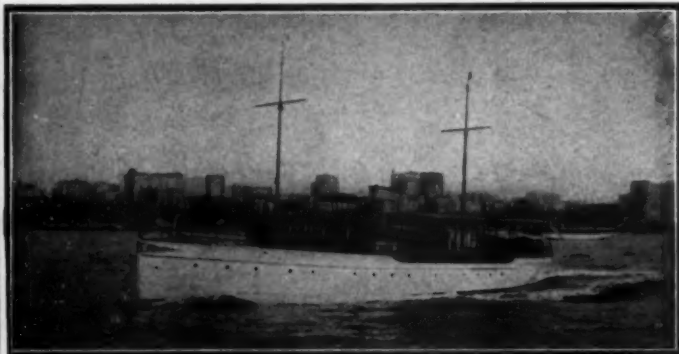
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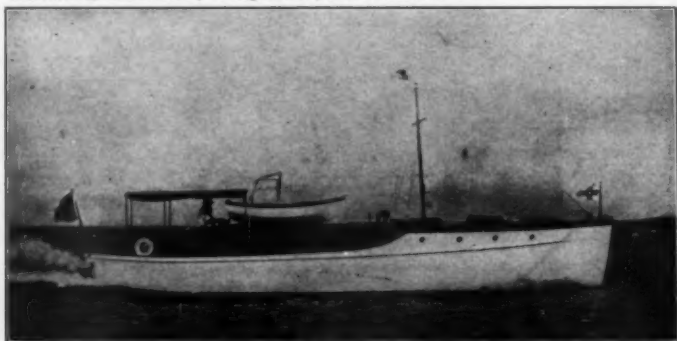
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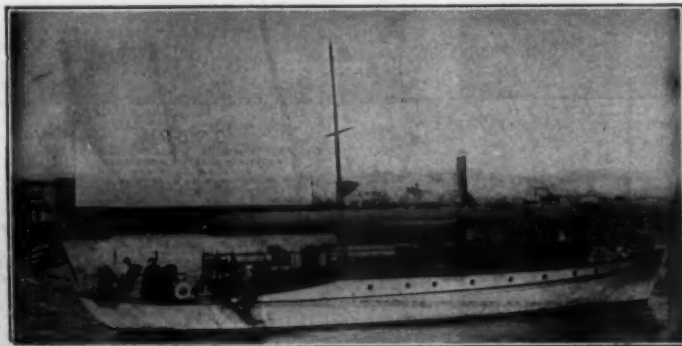
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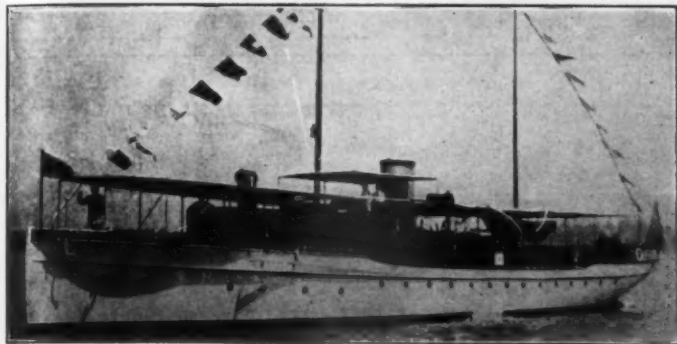
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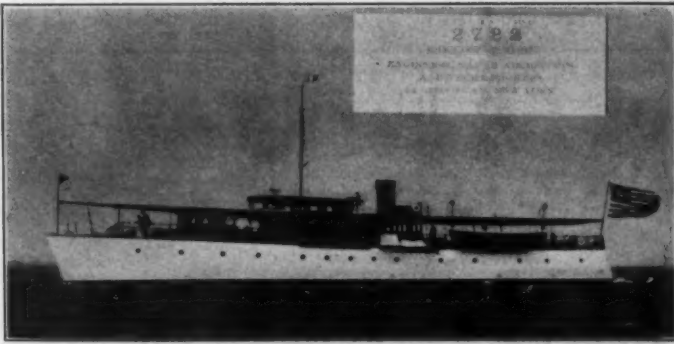
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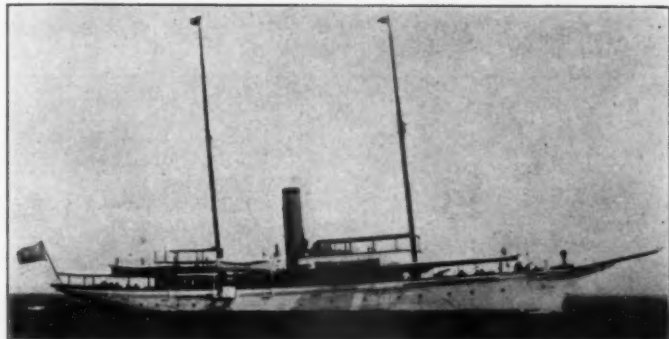
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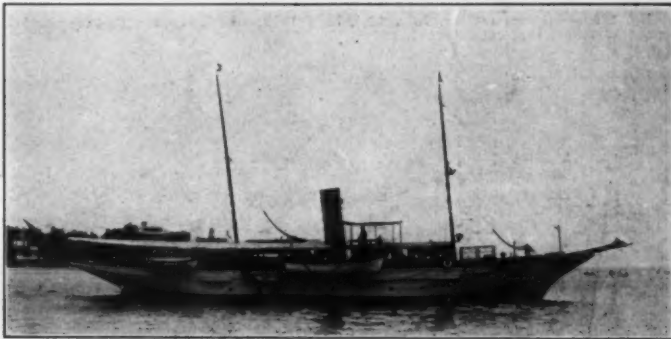
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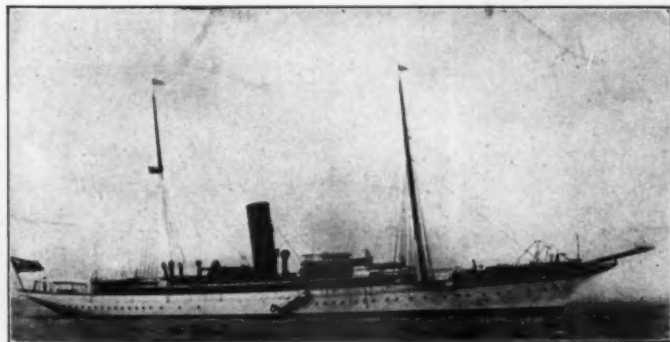
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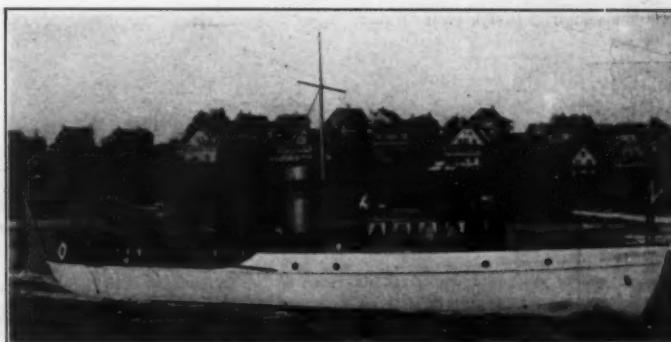
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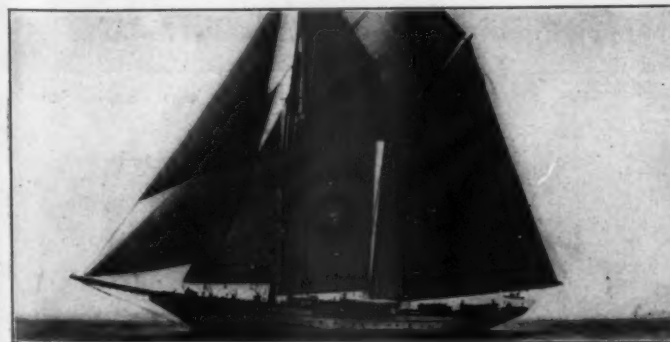
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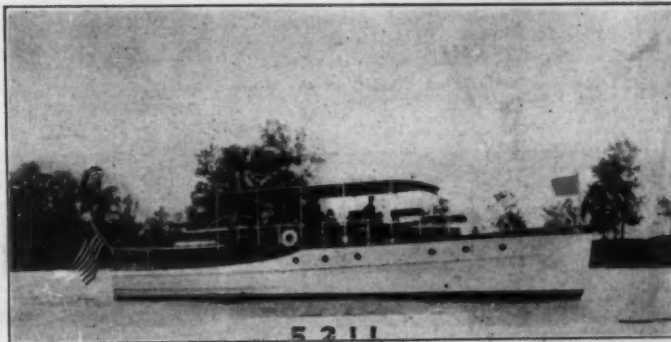
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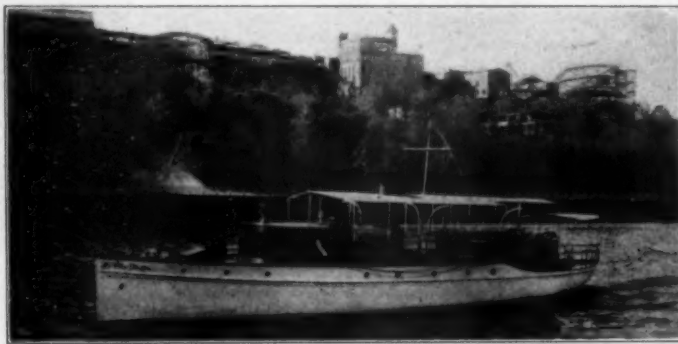
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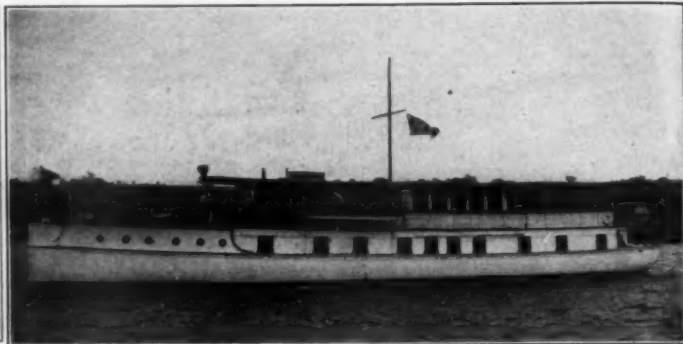
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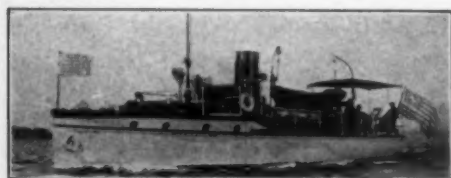
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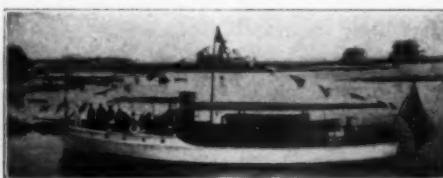
No. 1770.—Twin Screw cruiser, 75 x 13; Murray & Tregurtha motors, three state-rooms, bath, etc. Dining room forward.



No. 1227.—Sale—Charter—Lawley built cruiser, 90 x 14.6 six cylinder Standard; speed 12 knots.



No. 2076.—For Sale.—Bargain figure, 50 x 10.6 power cruiser, similar design famous Bermuda racer.



No. 1178.—Offered by an Estate; twin screw, 70 x 14, Standard motors, first class condition.



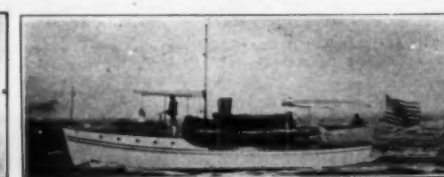
No. 1448.—Modern Cruiser, 63 x 12.7, built 1913, light draught, 20th Century motor. Suitable Southern waters.



No. 1782.—Fast Bridge Deck Cruiser, 56 x 9.6, new 6 cyl. 100 H.P. Murray & Tregurtha motor.



No. 1401.—Raised Deck Cruiser, 60 x 12, six cyl. Standard motor, sleeps six people.



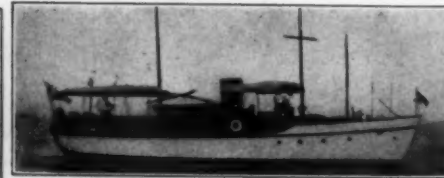
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No. 2055.—Bridge deck, 58 x 11.4 x 3.6, fifty H.P. Twentieth Century motor installed 1914, speed 12 miles.



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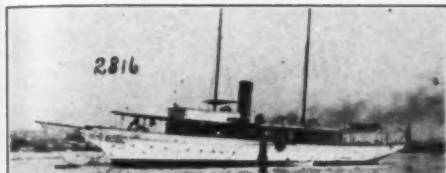
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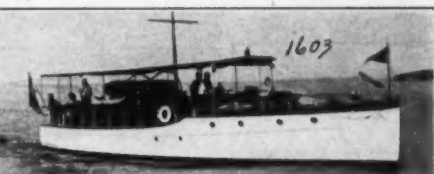
No. 1690—43-foot Cruiser. Stateroom and saloon sleep four people. Speed, 12-14 miles.



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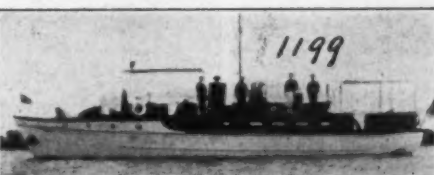
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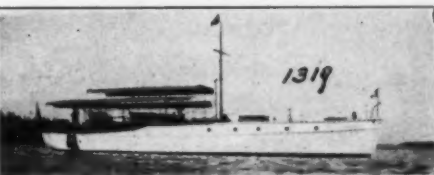
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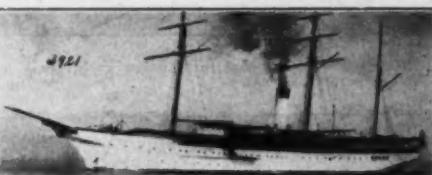
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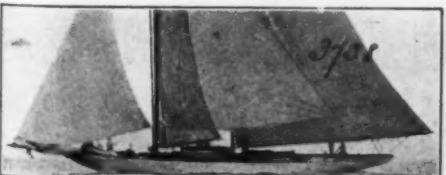
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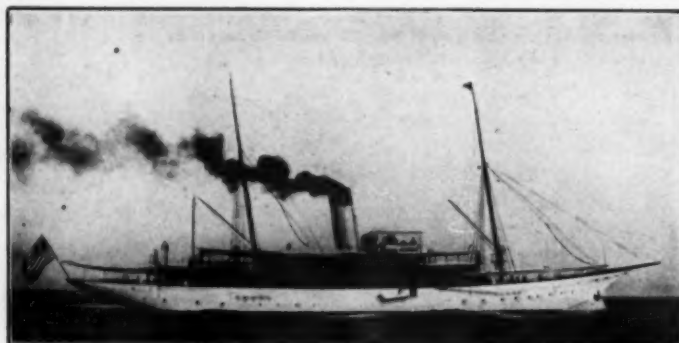
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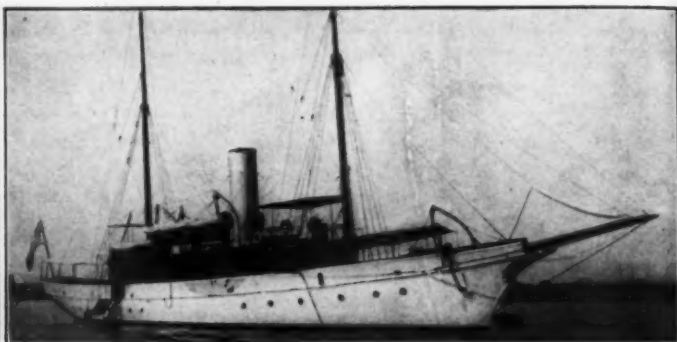
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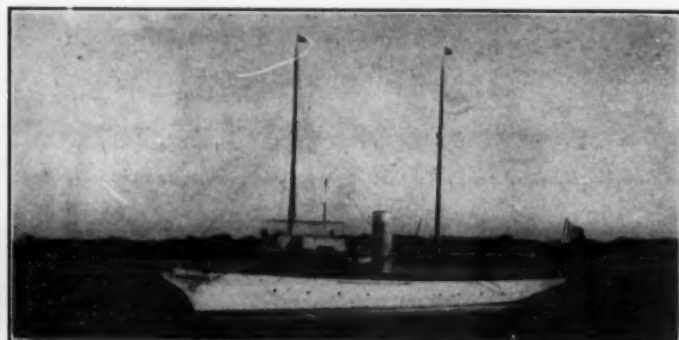
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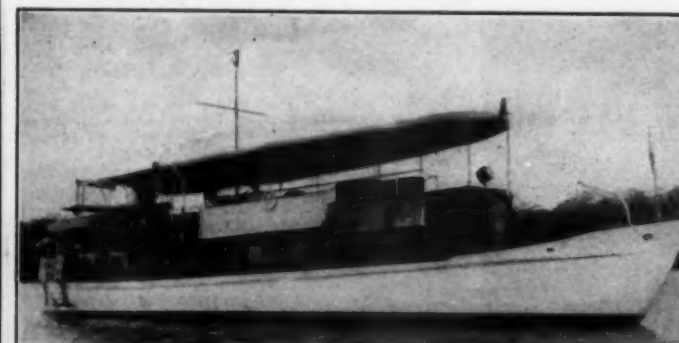
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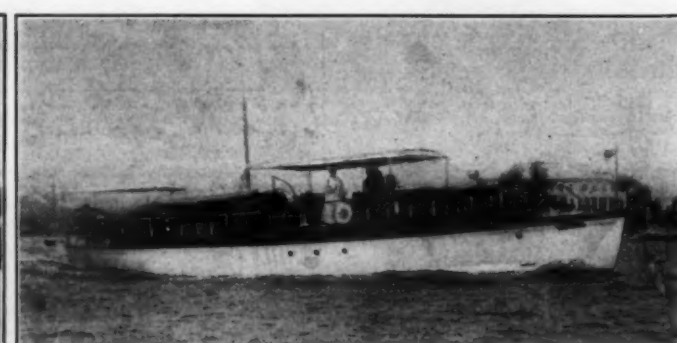
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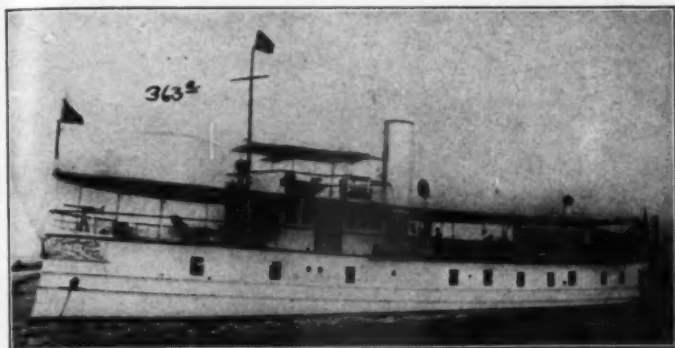


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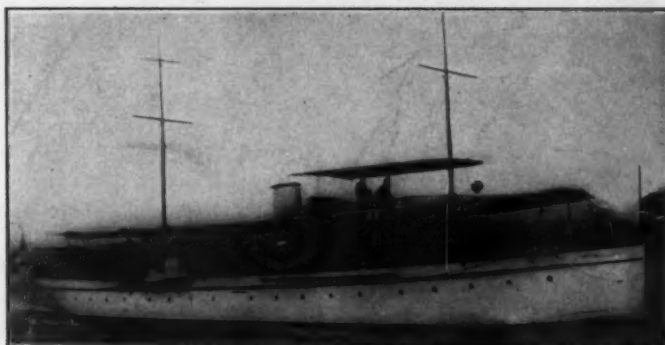
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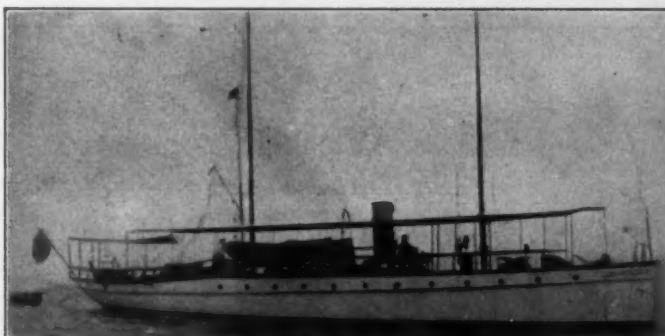
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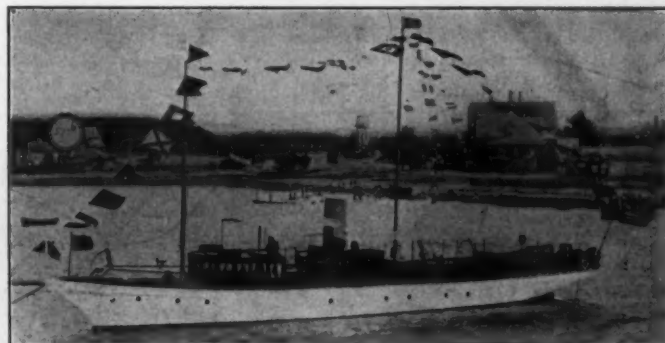
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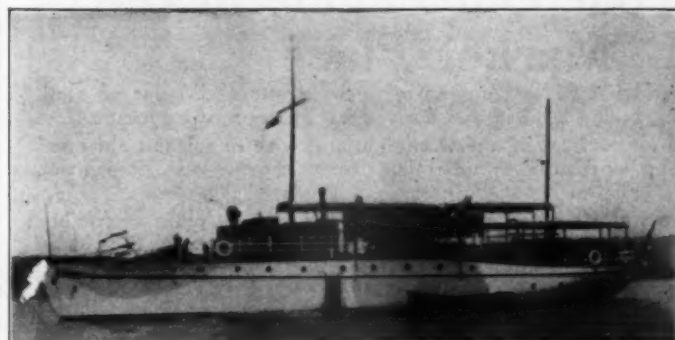
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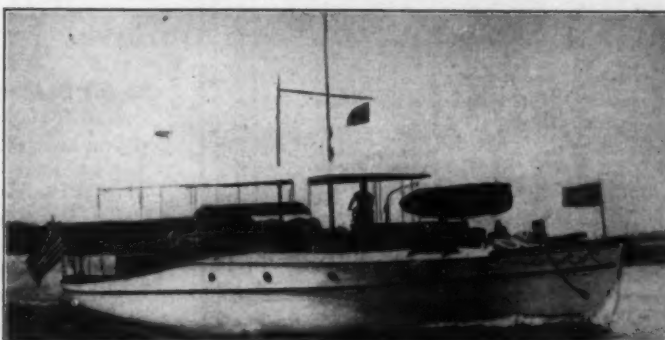
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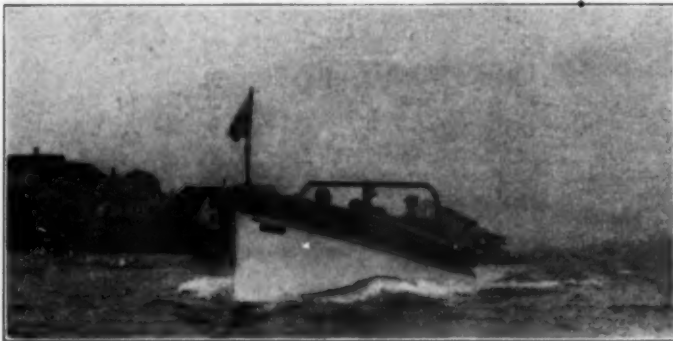
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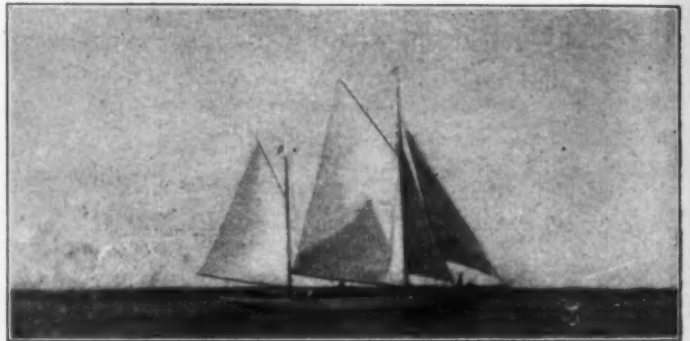
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## Sell Your Old Engine in the Market Place

Motor Boating's Market Place columns offer the buyer and seller of used motor boats, fittings, etc., a quick and convenient medium of exchange.

If you are getting a new boat or a new engine, and wish to sell the old one, don't have it rotting, or rusting, or collecting storage charges—sell it—in the Market Place.

Perhaps you have waterfront property suitable for a yacht club, or for individual yachting enthusiasts—the Market Place goes to over 25,000 individuals interested in all things pertaining to the water.

Try this Market—it is resultful.

#### MOTOR BOATING

119 WEST 40th STREET

NEW YORK CITY



## THE MoToR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:  
 Cut one inch deep, one column wide..... \$2  
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**Opportunities  
for the  
Motor Boatman**

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR Boating.

# BRUNS, KIMBALL & CO., Inc.

at the NEW YORK MOTOR BOAT SHOW

Grand Central Palace, January 29th to February 5th

Ask for Mr. Bruns, Mr. Kimball or Mr. Parr, at the STERLING booth. Don't fail to visit OUR OWN BOOTH, where we will exhibit the complete and increasingly popular Kermath line and the famous HERRMANN ARISTOCRAT 4-Cylinder, 4-Cycle, 9-12 H.P., completely equipped, for \$150.00. There will be other good things in OUR BOOTH. We will be located on the main floor in Section M.

Your present engine may be exchanged for a new one. Let us know what you have and get our offer.

When taking time to visit the Show, don't fail to come down-town and visit our store at 115 Liberty Street, New York City. We have over 200 rebuilt engines to choose from and a large stock of new engines. We can save you money. Send for our list.

## BRUNS, KIMBALL & CO., Inc., 115 Liberty St., New York City

BRANCH STORE—BOURSE BUILDING, PHILADELPHIA, PENNA.

PHONE, 945 CORTLANDT

ELCO RUNABOUT—Thirty-foot; forty horse; fully equipped, excellent condition. On account of no time to use her will sell for a very low price. BIER, 1496 Bedford Avenue, Brooklyn, N. Y.

FOR SALE—52 H.P. Mercury Special motor, 4-cylinder, 4-cycle. On shipping crate. Brand new. With rear starter. Bosch dual magneto. Price \$650.00. C. Kroemer, Jr., 1474 Flushing Ave., Brooklyn, N. Y.

FOR SALE—4 cylinder 4 cycle 40 H. P. copper jacketed high speed motor equipped with Remy Dual magneto, Schebler carburetor, 11-ft. shaft couplings, No-Bind stuffing box and Hyde propeller. Price, \$110.00. C. C. Rucker, K. & H. Hotel, Clarksburg, W. Va.

FOR CASH—2 Roberts, 1 Ferro (3 H.P.) store samples. Unused. Best offer buys. The Franklin County Engine Agency, Greenfield, Mass.

FOR SALE—6 H.P. Gray; Bargain, \$40.00 complete. R. C. Rhoades, Slater, Mo.

RICE STOCK MOTOR BOATS.  
 16-foot speed boats; 19-foot runabouts; 22-foot auto boats. State type interested in. Catalogue on request.  
 RICE BROTHERS COMPANY, East Boothbay, Maine.

CANADIANS, Second-hand engine bargains. Send for list.  
 GUARANTEE MOTOR COMPANY  
 73 Bay Street, North Hamilton, Ont., Canada.

For Sale Cheap—26 foot, glass cabin; boat one year old, with or without engine; also one 2-cyl. 4-cycle, 12 H. P. engine complete. G. C. Losey, 1010 Cass Ave., Grand Rapids, Mich.

POSITION as salesman or assistant to sales manager wanted—Have eight years' experience in yacht and vessel brokerage and marine products sales. Capable correspondent familiar with office routine. Well acquainted among shipyards, etc. "Sales," care MoToR Boating.

7 H.P. Palmer complete equipment, \$50. Want 10-15 H.P. state particulars and price. G. H. Lamb, Corona, N. Y.

FOR SALE—27 ft. cruiser, brand new, latest style. Price \$600 for quick sale. James Wilde, Pearl River, N. Y.

### TRINDONT ROTARY WHISLE OUTRITS at BELOW COST

High grade power signals suitable for boats from 12 to 50 ft. Formerly sold for \$15.00, \$25.00 and \$30.00, now priced below cost.

No. 0—\$10.00. No. 1—\$15.00. No. 2—\$20.00.

Run by friction contact with flywheel. Operated from any part of boat. An outfit that will outlast your boat. Order today.

TRINDONT ROTARY POWER CO. BRIDGEPORT, CONN.

USE "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

FOR SALE—Heavy Duty 3 cylinder Automatic, 40 H. P. Used very little; condition guaranteed. Weight, about 3,800 lbs. 32" Flywheel. No reasonable offer refused. Atherton, 261 Broadway, N. Y. C.

## PROFITABLE ADVERTISING

consists of placing your selling message before the greatest number of possible buyers.

Motor Boating has the largest guaranteed circulation in the marine field, reaching boat owners exclusively and of a class who can afford to buy what you want to sell. Write for rates and information.

119 West 40th Street

**MoToR Boating**

New York City

## THE MoToR BoATING Market Place

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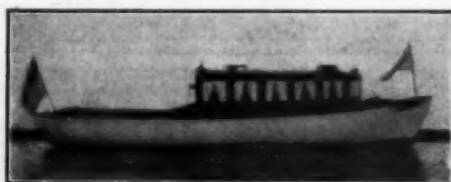
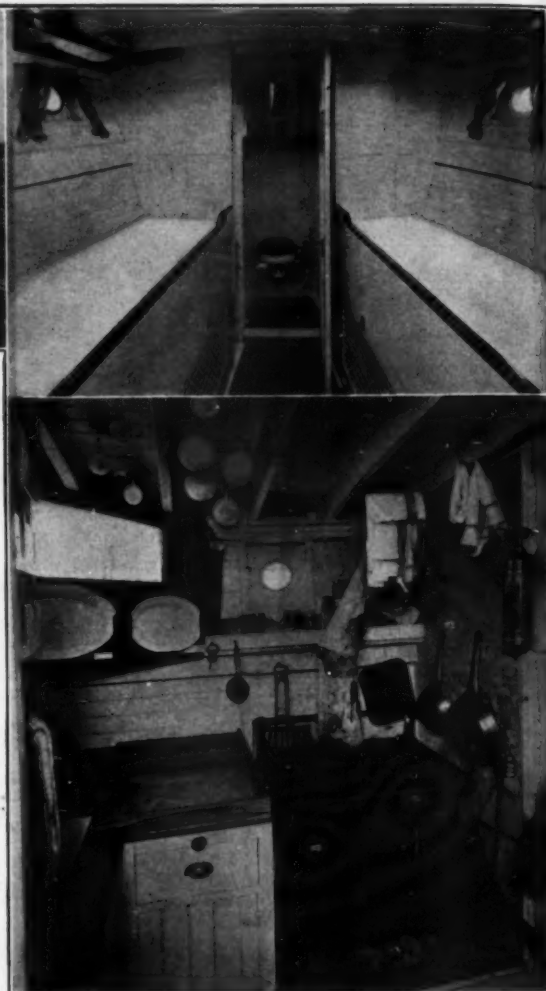
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Motor Boatman**

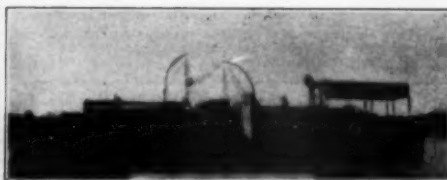
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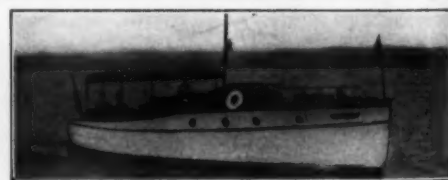
**FOR SALE—"Cero".** Excellent cruiser, 39 ft. 11 in. overall, 9 ft. 6 in. beam, 3 ft. 9 in. draft. Large cabin, staterooms and galley, completely equipped with ice-box, stove and sink. Powered with 16 H. P., 2 cylinder, 6 x 8 Mianus motor. Cero has won every race entered this year, including the Block Island event, the race around Long Island and the Cornfield Light race. W. P. Frost, 40 East 40th St., New York City.



**Comfort**, 32 ft. long, 10 ft. beam, 15 H.P. 3-cylinder, 4-cycle Palmer motor. Everything brand new and full equipment July 4th, 1915. Fastest boat on the sound. C. Kroemer, Jr., 1474 Flushing Ave., Brooklyn, N. Y.



**FOR SALE—A semi-speed cruiser**, good accommodations, 45' o. a., 9' 10" beam, 3' draft, twin screw, (2) six cylinder engines, good going boat. Apply Box G, Huntington, L. I., N. Y.



**FOR SALE—50' x 10'3" cruiser TRAVELER.** New York Show boat. Address The Matthews Boat Company, Port Clinton, Ohio.

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**MOTOR BOATING**

**119 WEST 40th STREET**

**NEW YORK CITY**



## NAVAL ARCHITECTS & YACHT BROKERS

**ARTHUR BINNEY**

Successor to EDWARD BURGESS

NAVAL ARCHITECT AND YACHT BROKER

MASON BUILDING, 79 KILBY ST., BOSTON, MASS.

Agent for The Standard Marine Motor, The Commercial Acetylene

Co. (Safety Storage System.)

TELEPHONES:

Office: 2702 Main. Residence: 3023-S Brookline.

YACHT BROKERAGE DEPARTMENT.

Charters, 10 per cent.

## BOWES & MOWER

NAVAL ARCHITECTS AND ENGINEERS  
YACHT AND VESSEL BROKERS

Offices: Lafayette Bldg., Chestnut and Fifth Streets.

Mail Phone. PHILADELPHIA, PA. Cable Bomo.

### Rebuilt Engines backed by a strict Guarantee

Bruce, Kimball & Co., 115 Liberty Street, New York City, offer over 200 rebuilt engines, fully guaranteed, at exceptionally attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Anderson, Herrmann Eagle, Hubbard, Northwestern. Write for offer.

## COX & STEVENS

Engineers and Naval Architects  
Yacht Brokers

15 WILLIAM STREET, NEW YORK CITY  
TELEPHONE 1275 BROAD

## JOHN S. EMERY & COMPANY, Inc.

Ship and Yacht Brokers.

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Yachts of All Types For Sale and Charter  
(Very Complete List)

Marine Insurance Effected. Established 1857.

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NAVAL ARCHITECT

NEW BEDFORD, MASS.

HAND-V-BOTTOM DESIGNS

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EAST GREENWICH RHODE ISLAND

## HARRY W. SANFORD

YACHT BROKER

500 Fifth Ave., (42nd St.) N. Y.

High-class sail and power yachts for sale and charter. I will be pleased to offer my services to those interested in purchase, sale or charter of any type of yacht.

Naval Architecture Marine Insurance  
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**J. MURRAY WATTS**  
Naval Architects and Engineers, Yacht and Vessel Brokers  
Office: 827-828 BROWN BROS. BUILDING  
22 CHESTNUT STREET PHILADELPHIA

## Changes Not Always Advisable

(Continued from page 41)

sion tends to extinguish or diminish a jump spark, while the positive action of make and break electrodes can do nothing but produce a good spark if a fair amount of electrical energy is applied. On all heavy-duty engines it is advisable to maintain the make and break system if it is so equipped. If it becomes inoperative, it is better to put this system in working order by replacing worn or damaged parts than to attempt the radical change to jump spark. The particular engine or type of engine would have much to do with the successful operation after the changes are made.

Jump spark ignition is mostly used on high-speed engines where a quick acting spark is required. High-speed engines infrequently operate with high compression. The make and break system is seldom used on this type of engine for various reasons, such as the inability of the make and break mechanism to operate with sufficient rapidity, excessive wear and noise on high speeds.

As there is such a large variety of make and break equipped engines, all of them differing to a certain degree, it is quite impossible to make a general drawing which will cover the subject of changing from one system to another. However, most engines having make and break ignition have the operating mechanism on the cylinders, mounted on a separable flange or cage. To rearrange the cylinders for jump spark ignition it is necessary to remove these cages and replace them with a flange somewhat similar to the one shown in the illustration on page 40. This flange is designed to bring the sparking points of the spark plug into the combustion chamber as far as possible or in approximately the same relative position as the old make and break points. While this is not absolutely necessary it is well worth while in view of the fact that the new system is to work under conditions not ordinarily expected of it. The flange is made to fit the cylinder where the old cages were taken off, and should be bolted on with the same bolts or studs that were formerly used, insuring ample strength to withstand the pressure.

The low tension coils will have to be replaced with high tension coils, and somewhere on the camshaft or shaft formerly used for operating the make and break mechanism a timer will have to be installed. This should be placed in the most convenient position for operation, care being taken that there is enough room or clearance around it to permit of advancing or retarding the spark. If the engine is of the four-cycle type the camshaft will give the proper speed for the synchronous operation of the timer. If two-cycle the crankshaft speed will be correct. With flanges and timer attached it is only necessary to make the electrical connections in the regular way for jump spark ignition.

A. DANIELSON, Chicago, Ill.

## Building an 18-Foot Runabout

(Continued from page 13)

frames good and fast, taking care to see that each is square with the center line of the boat and the top face of the building platform. Next bolt the stem piece and keelson to the keel in the manner shown in the sectional view, treating the faces that come together with a good coat of thick white lead paint. Fasten the stem piece down securely to the platform in its correct height and center position and bend the keel and keelson over the frames, clamping down tightly at each frame and taking care not to force these parts out in any way. With a good sharp twist drill bore down through the keel parts and keel piece of frame No. 1, and insert a 3/4-inch bolt of sufficient length, screwing down the nut tight (over washer) before proceeding with frame No. 2. Continue the drilling and bolting successively at each frame until you reach frame No. 5, which should be fastened to the keel with two long brass screws of good gauge, spaced well out toward the edge of the keel. By fastening frame No. 5 in this manner there is no danger of colliding with a bolt when boring through for the shaft hole later. Frame No. 6, is, of course, bolt-fastened, and the transom firmly screwed. When the keel parts have been thus properly fastened the clamps can be removed.

The notches (in frames) for the chine pieces are next in order and should be cut out slightly under-

(Continued on page 64)

## NAVAL ARCHITECTS & YACHT BROKERS

**IF**

YOU WANT A BOAT DESIGNED, BACKED  
BY EXPERIENCE, WRITE

**MORRIS M. WHITAKER, N. A.**

307 HIGHMOUNT AVENUE " NYACK, N. Y.

## Help your Dealers by Advertising

Up-to-date manufacturers do not consider their product sold when it has only reached the dealer. They follow it through until it is in the hands of the consumer.

Motor Boating is the most tangible dealer aid known. All the best dealers read it regularly, and they see what is being done for them in the way of advertising by the manufacturers they represent. Their appreciation is shown by increased loyalty for the manufacturer and enthusiasm for the product.

## MOTOR BOATING

119 WEST 40th STREET  
NEW YORK

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**IMPROVED THERMEX SILENCER**  
Increases Revolutions,  
No Back Pressure!




Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used free or under water—adjustable discharge. Lightest, cheapest to install. Free booklet shows why. Send for it to-day.

**THERMEX SILENCER WORKS**, 10 Lewis Street, East Boston, Mass.  
Branch, Stewart & Co., Charlestown, P. E. I.; Marine Engine & Supply Co., Los Angeles, Cal.; S. V. B. Miller, Seattle, Wash.; Burrard Iron Works, Vancouver, B. C.

**Solheim's Launch Works**  
Boats up to 60 feet, designed, built, repaired, engines installed  
Thirty years' experience.  
GREAT KILLS, STATEN ISLAND, N. Y.

**Polarine**  
THE BEST OIL FOR ALL MOTORS  
STANDARD OIL CO. of New York



A VOIL disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard pivot and high-grade jewel. Navy degree circle on dial. Brass and mahogany binnacles. Also new course finder and bearings instrument. Send for descriptive catalog.  
**EUGENE M. SHERMAN**  
Box 3 Bellevue, Wash.



If you want good circulation on your Automobile, Launch or Motor Boat, use a **LOBEE PUMP**  
**LOBEE PUMP & MACHINERY CO.**  
57 Bridge Street Buffalo, N. Y.

**PIERCE-BUDD MOTORS**  
Supreme among all makes of marine motors for their high speed, light weight and great power. For both high speed and medium duty service.

Write today for catalog  
**PIERCE-BUDD COMPANY**, Bay City, Mich.



**Detachable Folding Seat**  
Prepaid to any part of the U. S. A. Special prices to the trade. Write for printed matter: 150-page catalog will be sent on receipt of 5 cents to cover mailing charges. Write now.

**MODEL A** Polished Brass Frame \$3.50  
**MODEL B** Black Enamel Iron Frame \$2

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**Francke Flexible Couplings**  
remove the friction load from your engine, eliminate vibration, and allow the shaft to turn freely.  
At your dealer, or direct from  
**SMITH SERRELL CO., Inc.**  
Gen'l Sales Agent for THE FRANCKE CO.,  
West St. Bldg., New York City.

We have ready for shipment completed hulls, also semi-finished hulls from 16 ft. to 30 ft. We furnish knock-down frames and all parts for any size motor boat.  
Designers and builders of Launches, Cruisers, Auxiliary Yachts and Tenders. Write for prices and descriptions.  
**ROBERTSON BROS.**, Foot of Bay St., Hamilton, Can.

**SHAW PROPELLER**  
(Patented)  
Scientifically designed to secure maximum thrust efficiency from every square inch of surface—and does it. Manganese bronze. Guaranteed.  
Write for prices and guarantee  
**SHAW PROPELLER CO.**, Board of Trade Bldg., Boston, Mass.

## Building an 18-Foot Runabout

(Continued from page 63)

sized and then smoothed up neatly with a wood rasp for a neat fit in each case. When those in the frames and transom are all cut, bend in a thin piece of stock of the same width as the chine pieces and mark where these pieces come against the stem piece. At these marked locations on the stem cut the

### LIST OF BUILDING MATERIALS

Plan of 18-foot Runabout, later for ordering in quantity. This quantity is for the hull only. The engine, pump, and other accessories are not included. The list of materials is given in the following table. The quantities are given in the following table. The quantities are given in the following table.

Part	Material	Quantity	Notes
STERN	1/2" x 3" x 6"	1	For stern post
TRANSOM	1/2" x 3" x 6"	1	For transom post
CHINE	1/2" x 3" x 6"	1	For chine post
KEEL	1/2" x 3" x 6"	1	For keel post
FRAMES	1/2" x 3" x 6"	1	For frame post
DECK	1/2" x 3" x 6"	1	For deck post
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DECK	1/2" x 3" x 6"	1	For deck post
PLANK	1/2" x 3		





*Of course the winner  
was varnished with*

**VALENTINE'S  
VALSPAR**  
The Varnish That Won't Turn White

Photo by  
Cardinell-  
Vincent Co.

**A**S the representative of the Royal Danish Yacht Club of Copenhagen the Nurdug IV won the President Wilson Cup at the Exposition Regatta in San Francisco Bay. Last year, the same boat with the King of Denmark at the helm, won the six-metre championship of Europe against the best yachts the other nations could muster against her.

The selection of Valspar for the Nurdug IV emphasizes our claim that this varnish offers yachtsmen the utmost in varnish satisfaction.

Don't put a brush to your boat this Spring until you have tested Valspar at home and proved to your own satisfaction that it will not turn white in salt or fresh water. Assure yourself it is unusually durable yet quick-drying—that it is the best boat protection money can buy.

For 10c. in stamps, to cover cost of mailing and package, we will send you a liberal sample can of Valspar for this purpose together with an interesting booklet explaining in detail how to refinish your boat.

#### \$100 Prize Contest

\$100 in Prizes to be given for the best letters describing actual experiences with Valspar, why you chose Valspar, why you kept on using it and why you will use it in the future. Extra credit will be allowed letters which are accompanied by a photograph of the boat mentioned. The judges are Commodore J. Stuart Blackton, Atlantic Yacht Club, Grantland Rice, Sporting Editor of New York Tribune and A. W. Erickson, President of The Erickson Company, of New York. Contest closes February 15. No letters or photographs returned. See January issue or write us for full particulars.

VALENTINE & COMPANY, 456 FOURTH AVE., NEW YORK

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Toronto London Amsterdam

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VARNISHES  
Established 1832

Largest Manufacturers of High-  
grade Varnishes in the World

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Stockton San Diego Pasadena Long Beach Santa Monica Portland Seattle Tacoma Spokane Boise

**KNOX MOTORS**

Gasoline, Kerosene, Distillate or Alcohol  
Two Cycle and Four Cycle Models  
3 to 40 H. P.

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Camden Anchor-Rockland Machine Co., Camden, Me.

**"CARBO FLYER"**

**\$385** A real hydroplane, 14 ft. 3 in. x 4 ft. 10 H.P., 4 cylinder 4 cycle Universal Motor, high tension magneto, rear starter, reverse gear, salt water outfit.  
Speed about 15 miles. Cedar planking, mahogany trim, brass fittings.

**CARMAN & BOWES** Source Building Philadelphia, Pa.

**NORTHWESTERN TWO-CYCLE MOTORS**

18 H. P. with Complete Electrical Equipment **\$250**  
Row Boat Motor, \$50. 10 H.P., \$150. 2 H.P., \$50. 4 H.P., \$75. 7 H.P., \$100.

Sold on 30 Days' Free Trial. Write for Catalog.

**NORTHWESTERN MOTOR CO.,** 850 Spring St. Eau Claire, Wis.

**Dependable Fittings**

Whistle outfits, Mufflers, Muffler Cut-outs, Filters, Fog bells, Stair locks, Combination flag pole and electric aft lights, Spark, throttle and reverse controls, etc.

Ask for Catalog B 5.

**GRAY-HAWLEY MFG. CO.,** 937 Jeff. Ave., Detroit

**CROCKETT'S****Spar Composition**

—the original and best known exterior marine varnish in the world. The best interior finish is Crockett's No. 1 Preservative

Send for Catalogue.

**The David B. Crockett Co.** Bridgeport, Conn.



**OLD SOL** Electric Marine SEARCHLIGHTS  
Write for 1916 catalog

**TRINITY BELL**

The greatest and most pleasing warning signal for motor boat or motor car. Warns both Ear and Eye. Absolutely guaranteed. Patent applied for Nov. 6, 1914. Prices, \$3.00 to \$8.50. Write for full particulars.

**The Trinity Bell Electric Mfg. Co.**

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**J-M FIRE EXTINGUISHER**

Approved by and bears Label of Underwriters Lab., Inc.

**H. W. JOHNS-MANVILLE CO.**  
New York All Large Cities

**HOLMES-HOWARD MOTORS**

Sturdy high-grade, light-weight, unit power plants rated at 6 to 8 horsepower. Two-cycle, three-port type. Weight 135 lbs., including reverse gear, magneto and all equipment. Finest up-to-date design, construction and equipment.

**\$160.00** Complete, including all equipment propeller, shaft and stuffing box.

Write for prices on 4 and 6 cylinder motors.

**THE HOLMES-HOWARD MOTOR CO.**  
30 Newland Bldg., Detroit, Mich.



Something new in Motor Boat Tops and Equipment. Send at once for our New Catalogue, just out.

**THE C. Z. KROH MFG. CO.,** TOLEDO, OHIO

**Where Shall We Cruise Next Summer?**

(Continued from page 64)

south of the bay but no gasoline. Next north is Port Kent, where there is a good dock. Gas is unhandy and the stores do not give a large variety. This is the starting point for the famous trip through Ausable Chasm.

North from Port Kent the next harbors are on Valcour Island. They are lonesome and those on the west side of the island are exposed to northwesterers. A little further on is the dock for Hotel Champlain, and then we come to Plattsburgh. Plenty of gas, provisions and all kinds of supplies may be had at this town and there is a good dock with special facilities for motor boats.

An inspection of the chart will show that the lake narrows at this point and contains many large islands from here on. The scenery is superb along these islands and they should be thoroughly explored. Going north from Malletts Bay or Plattsburgh we come to Adam's Landing, on the east shore, where there is a dock and general store. Watch your charts carefully and pass through the railroad draw into The Gut. Swing sharply to port after passing through the draw and you will find an old dock about 1,000 feet away. Either tie up here or anchor anywhere in the bay away from the main channel. The fishing is usually good at either the railroad draw at this end or at the highway draw at the other end, with a trolling ground in between. No supplies or gas can be obtained.

Passing out the east end through the highway draw there are three routes open. To the south, on the Grand Isle shore, are Keeler Bay and Sand Bar Bridge, both of which offer a sheltered anchorage, but no supplies or gas. To the east, around Pottery Island lies the opening to St. Alban's Bay and at its northern end is the town of the same name. Plenty of supplies, gasoline and ship hardware may be obtained here, but the anchorage is poor as it is exposed to the south—although a dock affords some protection. Do not attempt the narrow cut-off passage north of Pottery Island with any boat at low stages of the water and only with a small boat at any stage. To the north of The Gut a short distance is North Island City. It is a small village with an old dock where supplies may be obtained and also gas by carrying it for half a mile in five-gallon cans. The bay at North Island City is not a good anchorage, but just north of it is a little bay which is fairly well sheltered and has scenic attractions. This arm of the lake lies between Vermont main land and North Hero Island and is worth exploring, but contains no harbors or places of special interest. At its north end it connects to Alburgh Passage.

Proceeding northward from Adam's Landing, instead of entering The Gut, we shortly reach the southern end of Isle La Motte, where the path divides again. It might be remarked that by lying in close to the west shore of Treadwell Bay, or at the old dock in Monti Bay near Point Au Roche light, fairly sheltered positions may be obtained. Pass to the west of Isle La Motte and as you near the north end of the island watch your charts and buoys carefully, as there are several reefs. Run past the long Government breakwater at Rouses Point, and about one mile north you come upon the residence of that well-known friend of all motor boatmen—Doctor Marnes. Most important! Keep well off shore until directly opposite the Doctor's and then run in. This will avoid a mass of old stone-filled cribs which formerly supported a railroad station and which are at the present time just under water. The writer ran on them hard and nearly sank his boat. The shock and the next four days spent in repairs impressed them upon his mind in such a way that they will never be forgotten. There is a splendid harbor here with gas, supplies and real hospitality. This is within a few miles of the head of the lake and about a mile from the Canadian border. It is an attractive run up the Richelieu River for twenty-four miles to St. John's, Canada, stopping about half way up at the ruins of old Fort Lenox.

Starting again at the southern end of Isle La Motte turn to the east into La Motte Passage. This opens at the north end through a draw into the main body of the lake, and with its several bays offers good anchorage. It will be best, however, to run through the railroad draw and into Pelots Bay, where you can lie peacefully undisturbed during any gale and incidentally have good trolling grounds. No gasoline or supplies are obtainable here. Running up the narrow Alburgh Passage a country store is available at the highway bridge. Continuing on we come to the large body of water extending into Canada, known as Missisquoi Bay, the principal points of interest being Highgate Springs, Vt., and Phillipsburg, Canada. This end of the lake is not worth a trip unless one is bent upon exploring the entire lake. Otherwise do not go north of the railroad bridge at East Alburgh.

The above brief description is meant to cover the main points of interest, good harbors, etc., without suggesting any definite cruise. There are innumerable beauty spots worthy of attention which have not even been mentioned. A cruise should be laid out by keeping in mind the time available, not trying to cover too much ground in a limited time. It will take at least a month to cover the lake and to give six weeks to it would be better. If you are in the position of the majority of cruisers and do not have that much time at your disposal, divide the cruise up and take parts of it in different summers. Plan this summer's cruise for Lake Champlain and you will be assured a good time.

**The 1916 Show**

(Continued from page 38)

The Monarch Valve Co., of 112 Front street, Brooklyn, N. Y., has its usual complete display of Monarch carburetors, mixers, generator valves and coils. In this booth may also be found check valves, auxiliary air valves, pump suction connections, pump strainers, rotary bilge pumps, circuit breakers, gasoline refiners, etc. Monarch stuffing boxes are made in sizes ranging from five-eighths inch to two inches and are sold at prices ranging from \$1.50 to \$9.

Charles P. McClellan, of Fall River, Mass., is showing this year representative equipment from

(Continued on page 68)

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**KRICE Carburetor** 20% More Power 30 DAYS TRIAL

We absolutely guarantee the Krice Carburetor to use less gasoline—give better fuel economy and 20% more power. Your money back if it doesn't. Write today for catalog.

Krice Carburetor Co. 1251 Rockwell, Detroit, Mich.

**ANDERSON ENGINES**  
**MAKE GOOD**  
Under all Conditions  
**Anderson Engine Co.**  
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**TEXACO MOTOR OIL****STANLEY MARINE MOTOR**

High in Quality—Low in Price  
**THE STANLEY CO.**

SALEM, MASS.

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**GIES REVERSE GEAR**

The Choice of 25,000 Motorboat Owners

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Special No. 1, \$15.00 Model E : \$20.00  
Model A : 24.00 Model F : 30.00  
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**GIES GEAR COMPANY**

45 EAST FORT STREET DETROIT, MICHIGAN

**Gordon Reversible Propeller**

Quick reversing—perfect control. Means safety—reduced fuel consumption—less wear and tear on engine. Most practical for auxiliaries—blades feather fore and aft. Different size blades and woodline blades interchangeable. Cost more at first—less in the end.

Write for catalog and prices.

**THE GORDON PROPELLER CO.**

9006 Desmond Ave. Cleveland, Ohio, U. S. A.

**THE SMALL ARISTOCRAT**

9-12 H.P., 4 Cyl., 4 Cycle.

With High Tension Magneto, Kingston Carburetor, Bronze Water Pump, Standard Reverse Gear, \$150.00.

\$160.00 with Rear Starter Attached.

9 H.P. at 1000. 10 1/2 H.P. at 1200. 12 H.P. at 1400.

Motor can be run 300 r.p.m. or 3000.

Write for further information.

**THE HERRMANN ENGINEERING CO.**

Detroit, Michigan, U. S. A.

**How Do You Find Business?**

Business is booming in many lines. Thousands of people have more ready cash to spend than they ever had before. Many of these are boat owners. Many more will become boat owners before the season is over.

You can make this your banner season. Push your business while the opportunities are so great. Advertising in Motor Boating will help you.

Use large space for the next few issues. This period will establish your sales record for the year. Will it be big or little?

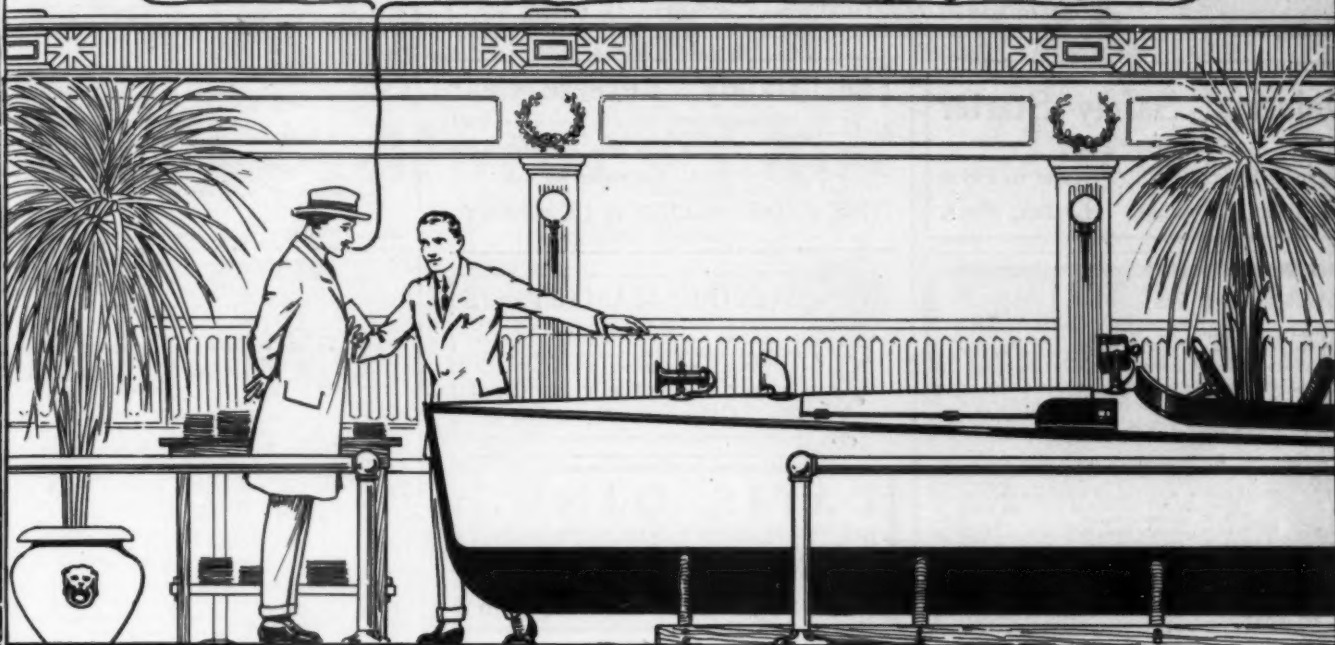
Big men believe in advertising. Big successes have been built upon it. Let it be the foundation for your success.

**MoToR Boating**

119 West 40th Street, New York City



What do you mean by "completely equipped"? —  
has it a Leece-Neville Electric Starting-Lighting System?



**S**TRAIGHT from the shoulder and right to the heart of the equipment matter, this man's question gives you boat and engine builders no choice—you must answer—must show whether your idea of "complete" measures up to the idea NOW in the minds of men who will buy boats and engines this year.

These men will visit the show to get *your* ideas; but remember this—they will bring with them well-defined ideas and preferences of their own, and these are your vital problem. You will soon discover this if you have overlooked or underestimated the nation-wide popularity and demand for Leece-Neville Electric Starting and Lighting Systems.

When the inevitable, not-to-be-dodged question is put up to you—an attempt to excuse the absence of a Leece-Neville System will be your confession to the prospective buyer that you really mean *near-complete* when you say complete.

A pint of preparedness is better than a barrel of remedy, and at the show you will find that more than twenty of the far-sighted engine makers and boat builders have anticipated this vital question, can answer it *right*—and before it is asked—thus making "Leece-Neville equipped" and "one-man-control" very strong selling arguments.



Write for full information or see us at the show

**THE LEECE-NEVILLE COMPANY**  
CLEVELAND, OHIO

**"COLE" COURSE PROTRACTOR**

Get acquainted with M. C. Co. nautical instruments. "POLARIS" Liquid Compasses in various sizes. "PERFECT" Electric UNDERLIGHTED Compass; costs less than a binnacle. New "COLE" BEARING FINDER fits any compass. Brass and Mahogany Binnacles. Send for interesting catalogues.

Box 45, MARINE COMPASS COMPANY, BRYANTVILLE, MASS.

**Universal Safety Starter**

Best by Test

High in Quality Low in Price  
311 Atlantic Avenue Boston, Mass.

**BOAT and YACHT LUMBER**

and where to get it—at  
HENRY J. WINDE, 104 Beverly Street, Boston, Mass.  
White Oak for Bending, Cedar Boards  
and Hackmatack Knees a Specialty.  
Careful attention given to mail orders.

**Motor Satisfaction**

Comes to every user of Watkins Special Motors. Especially fine for canoes and light boats.  
3 H. P. Single Cylinder ..... 25 lbs.  
6 H. P. Double Cylinder ..... 55 lbs.  
2 H. P. Four Cylinder ..... 140 lbs.  
Aluminum base, copper water-jackets,  
steel shaft, bronze bearings.

**The Watkins Motor Co.**  
824 BAYMILLER ST., CINCINNATI, O.

**SOMETHING NEW**

"Dandy Jr." Power Tender.  
10 ft. x 4 ft., semi-round, 2 1/2 H. P.  
stikaly, cedar, planked, \$68.00.  
9 ft. "Dandy" rowing tender, full round,  
mahogany trim, \$75.00.  
10 ft. "Special" for detachable motors, \$65.  
"Wilecain" detachable rowboat motors,  
\$55.00.  
Flat bottom cedar dinghies, per ft., \$2.00.  
WATER CRAFT CO., 221 Fulton St., N. Y.

**WHITE BOAT CEDAR**

Mahogany, and all other Boat Woods  
A large assortment of sizes. Lots to meet your particular  
requirements. Immediate quotations. Prompt shipment.  
WM. P. YOUNGS & BROS.  
First Avenue and 36th Street, New York.  
Established over 50 years. Telephone 2710 Murray Hill.

**MILLER**

1916 PORCELAIN SPARK PLUG  
GUARANTEED

Only the finest quality of material  
is used.  
Made in standard sizes.  
Delivered to any part of the world  
by parcel post.

PRICE, \$1.00 EACH.  
Special price to Manufacturers,  
Jobbers, Dealers and Agents.  
Agents wanted in unoccupied ter-  
ritory.

1916 Annual Catalog mailed free.  
**CHAS. E. MILLER**  
The Largest Automobile Supply  
House in America.  
Home Office: 97-103 Reads St., N. Y.  
14 Branch Stores in U. S.

**FIGURE 1464  
IMPROVED MOTOR BOAT CLOSET**

Dimensions: 18  
x 18 x 11"  
high to top of  
bowl; 2 1/2" cyl-  
inder. For above  
or below water  
line.

The best little closet on the market today,  
possessing many of the advantages of the large  
size toilet. All brass and porcelain. Oak seat  
and cover.

Price ..... \$25.00  
**THE J. H. CURTISS CO.** 2 South Street,  
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**The "Dandy" Reverse Gear**

During the last two seasons this gear has shown itself  
able to withstand the hardest kind of service.  
Working parts run in a bath of oil. Clutch is the  
multiple disc type.

Material and workmanship best money can buy.  
Write for catalog and prices.

**THE BROWN CLUTCH COMPANY**  
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**ELECTRIC SEARCHLIGHTS**

We make searchlights in sizes from 7 in.  
to 60 in. diameter, suitable for small  
launches and yachts and for the largest  
battleships. Send for Catalog A.

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**DAVIS DINKS**

First thing the yachtsman thinks of when he needs  
a tender is a "Davis Dink." Light, strong and  
serviceable. Both row and power in stock. Sizes  
8 ft. to 16 ft. Our 8 ft. row weighs 65 lbs.

Send for Catalog.  
The Davis Boat Works Co., Washington St., Sandusky, O.

**MONARCH SPAR**

Durable Marine Varnish

Has stood the Test for Years

**CHAS. H. GILLESPIE & SONS**

Established 1824 JERSEY CITY, N. J.

**FOR HIGH SPEED WORK**

CURTISS FLYING BOATS, used everywhere; speed 60 to  
80 miles per hour. Safest, most comfortable, fastest.  
CURTISS HYDROPLANES, 35-50 m. p. h., moderate cost.  
CURTISS MOTORS, 40 h. p. to 200 h. p., five models;  
used and accepted as best by six leading governments.  
ILLUSTRATED LITERATURE FREE ON REQUEST.

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**Put "Pep" in your Motor Boat**

The RANDERSON AUTOMATIC  
PISTON RINGS will give your engine  
more power at a low consumption of gas.  
Get them now.

**DUBOIS MACHINE SHOP, Inc.**  
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**Largest Guaranteed  
Circulation**

in the marine field — over  
25,000 a month — including  
boat owners, clubs, race en-  
thusiasts, dealers, manufactur-  
ers — the best of each class.  
Advertising in Motor Boating  
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Write for rates.

**MoToR BoATinG**  
119 West 40th St., New York.

**The 1916 Show**

(Continued from page 66)

his line of auto boat tops, life preserver cushions,  
spray hoods and boat covers. One of the runabout  
tops which is especially featured is known as the  
1914 One Man Auto Top. This type is built to  
order in lengths up to 14 feet. The framework is  
made of the best grade white oak reinforced at the  
bottom, and is so constructed that a full length  
top or one three to five feet shorter may be used  
by furling the front bow to the forward main bow.  
This style of top, therefore, leaves the forward  
part of the cockpit open or covered as is preferred.  
All fixtures and fittings are of heavy bronze highly  
polished and the cover and curtains are made of  
twelve-ounce Government Standard khaki. All cur-  
tains are well lighted and are detachable, being  
fastened to the top with the latest and most im-  
proved curtain fasteners.

The North East Electric Co., of Rochester, N. Y.,  
is showing its electric starting and lighting sys-  
tem for motor boat use. This system is of the  
single unit type, one machine cranking the motor,  
lighting the lamps and charging the storage bat-  
tery. Auxiliary equipment consists of the adjust-  
able silent chain by which the motor-generator is  
connected to the engine, the starter switch, the  
lighting switch, the battery current indicator and  
the 12-volt storage battery. The lighting system  
is of the single wire or grounded type. The motor-  
generator is constructed with a detachable hood  
to simplify inspection of the brush arrangement.  
There are two brushes for each terminal, this con-  
struction allowing the machine to operate even  
though two of its units should become broken.  
Simplicity is the keynote of the entire system.

The C. A. Woolsey Paint & Color Co., of Jersey  
City, N. J., has an exhibit which is in keeping with  
the goods it manufactures. A liberal number of  
color cards and pamphlets will be distributed, and  
the firm's representatives are on hand to welcome  
customers and prospective customers and to give  
information regarding its manufacturers to those  
desiring it. The Woolsey Company especially  
recommends its copper paints, yacht white, Adam-  
ant deck paint, engine enamel and Sparon marine  
varnish as the best products for motor boat use.

The Albany Boat Corp., of Albany, N. Y., is ex-  
hibiting at the show a distinctive example of its  
line of high-class runabouts and hydroplanes. This  
company is specializing on this type of boat as  
well as on express cruisers up to 75 feet in length,  
and it is also enlarging its design department to  
do general naval architecture. One of this com-  
pany's models which is expected to be a big leader  
during the 1916 season is a 28-foot runabout with  
an extreme beam of 6 feet 1 inch. With a four-  
cylinder Van Blerck motor installed, leaving room  
for a seven-passenger cockpit, a guaranteed speed  
of 28 miles per hour is promised, and with a six-  
cylinder Van Blerck with five-passenger cockpit  
a speed of 35 m.p.h. is attained. It is one of the  
finest of the Albany company's creed to supply  
every last item of equipment which the buyer de-  
sires without extra charge, and another interesting  
feature of this concern's policy is that it is willing  
to accept its boats back in the fall for trade for  
new models to be delivered in the spring.

The crowd around the booth of Valentine & Co.,  
of New York City, is always an interested one, and  
this year as usual, a silver-tongued orator is on  
hand to point out the various features of Valspar  
varnishes and paints. As visible evidence of the  
claim that Valspar never turns white, there is a  
running water machine on display which consists  
of a pipe with several outlets from which water  
is allowed to play on panels coated with various  
different makes of spar varnish. The center panel  
is painted with Valspar and the others with dif-  
ferent unnamed compositions, and although at the  
beginning of the week all are of the same luster  
and color, it will be observed that in the course  
of three or four days only the Valspar panel re-  
mains in its original state, while the others show  
varying degrees of whiteness and loss of luster.

The Bolinders Co., of 30 Church street, New York  
City, is showing this year its Model M engine  
which is stated to possess the advantage over other  
hot bulb motors that it dispenses with fresh water  
injection into the cylinders, thereby eliminating the  
necessity of carrying fresh water tanks on board  
ships. Bolinders motors are made in a number of  
sizes and have been used with great success in  
this country, particularly on the west coast.

The Gillespie-Boynton Co., Inc., of Paterson, N. J.,  
has taken space at the show and is exhibiting  
several of its well-known line of monobloc two-  
cycle motors. These motors are made in one, two,  
three and four cylinders and all of the multi-cyl-  
inder motors have the cylinders cast in one block.  
There are two two-cylinder sizes developing 10  
and 14 h.p., respectively, one 15 h.p. three-cylinder  
motor, and one 20 h.p. four. A 7 h.p. single-  
cylinder motor which is included in the line has  
5 x 5-inch cylinders, as has also the two-cylinder  
14 h.p. motor; all the others have 3 1/4 x 4 1/4-inch  
bore and stroke.

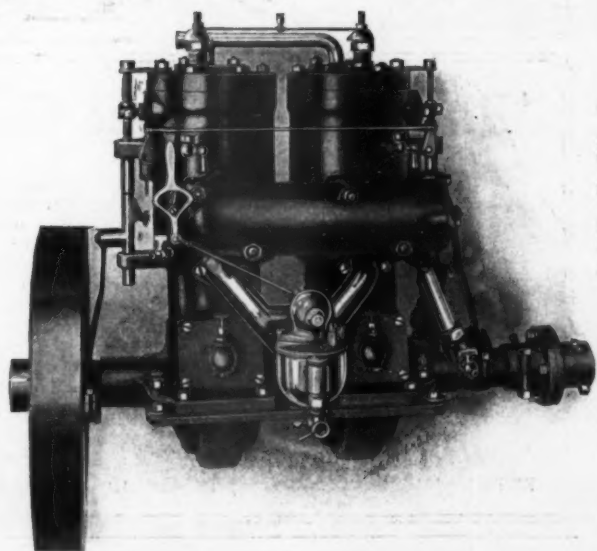
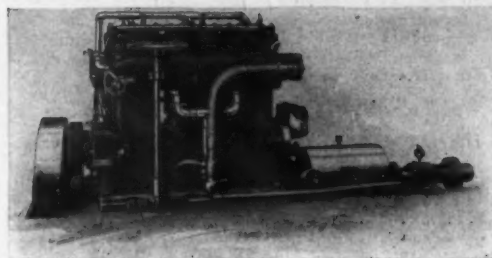
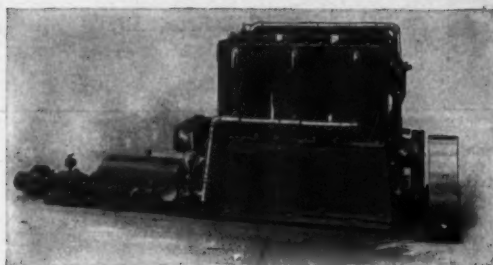
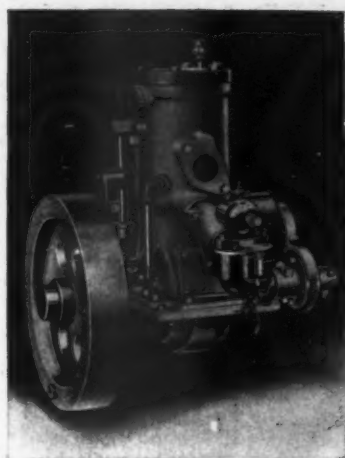
The Standard Gas Engine Co., of San Francisco,  
Cal., which has taken space at the Palace, is  
one of the most successful builders of marine en-  
gines on the Pacific Coast, and its motors are well  
known on this side of the continent. They are  
all of the four-cycle type and are put out in a  
great variety of sizes sufficient to accommodate  
the needs of almost any boat owner from that of  
a small open boat up to a heavy cargo ship. One  
of the features of the Frisco Standard motors is  
that they are designed to run on any fuel from  
gasoline to distillate.

The Leece-Neville Co., of Cleveland, O., is show-  
ing an interesting display of its electric lighting  
and starting systems. This company was one of  
the first to interest itself in electric starters for  
marine motors, and its efforts in this line have  
been rewarded inasmuch as upwards of a dozen  
engines are regularly fitted with its starters.  
Leece-Neville systems are made in various types  
and in single and separate units. The two-unit  
types in which the electric generator and motor  
are separate are designed for use on all engines,  
while the single-unit types are for small motors.



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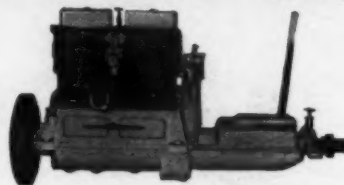
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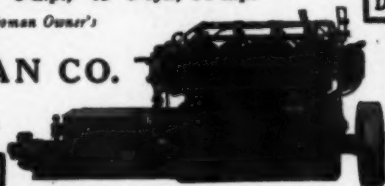
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Isn't  
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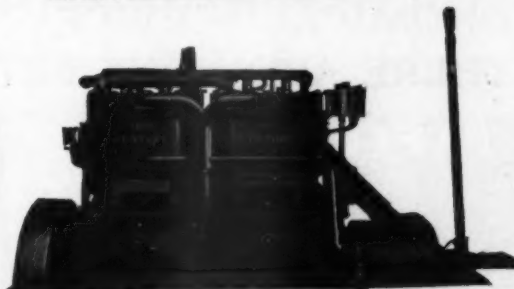
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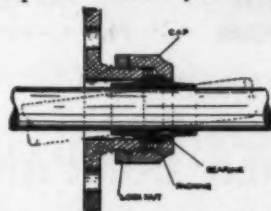
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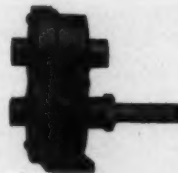
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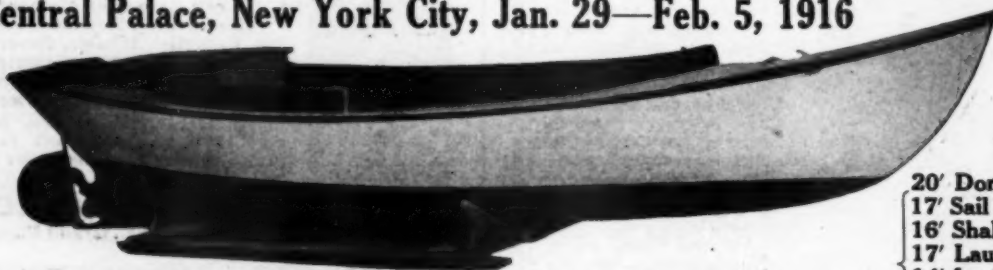
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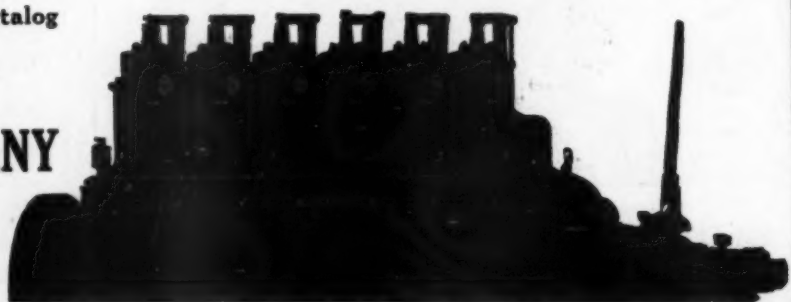
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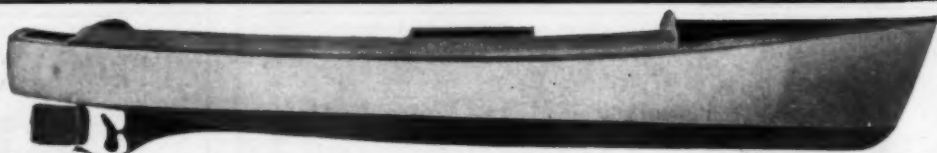
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We are the manufacturers of the well-known Comet Magneto, and there are thousands of them used for ignition and lights on power boats. Sixteen years' experience in magneto building has enabled us to produce the Eureka lighting outfit.



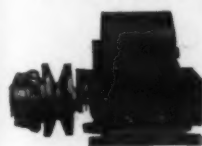
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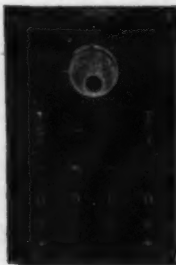
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If you enjoy working with tools and want an open launch, build it with your own hands, starting with one of our K. D. frames. You can build the finest 25 ft. launch from the K. D. frame and equip it with power for less money than you would have to pay for the cheapest 18 ft. launch on the market.

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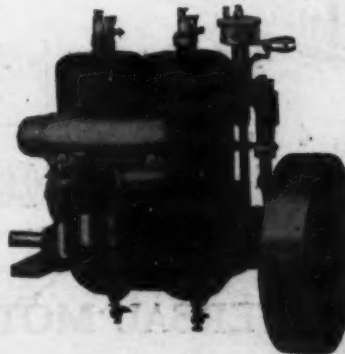
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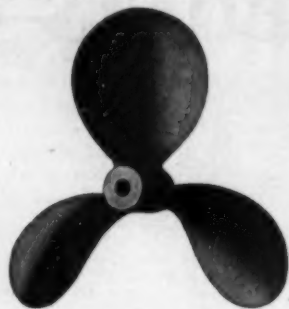
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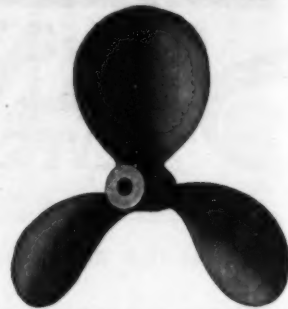
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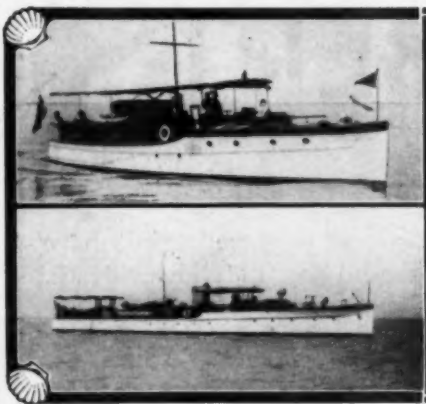
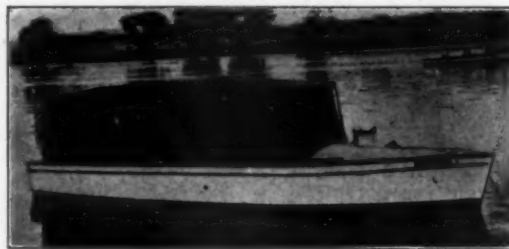
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If high speed is a factor, this can be secured in combination with the above.

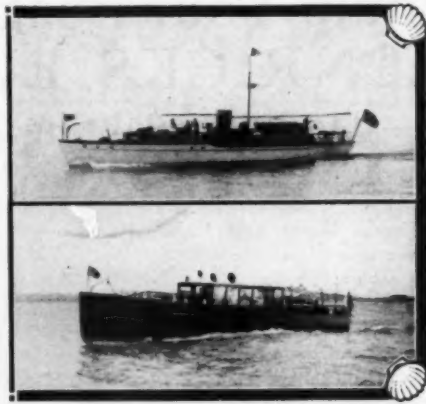
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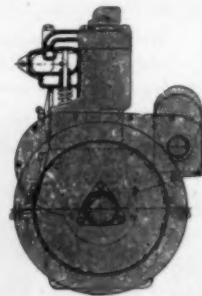
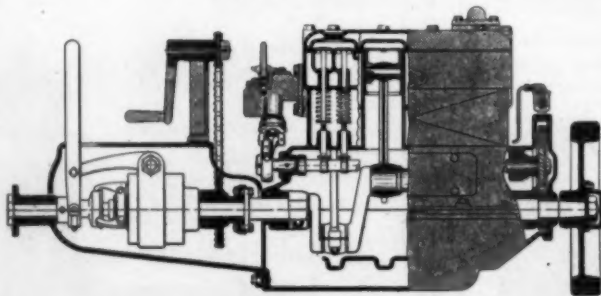


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# HACKER-ALBANY

## FAST BOATS

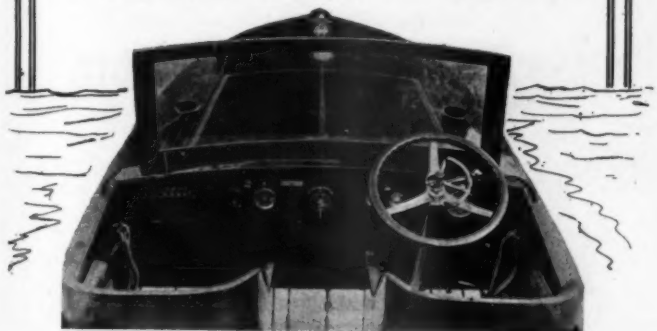
The boats designed by Mr. John L. Hacker have been among the most successful racers of recent years. Those who like fast boats, for general use, as well as for racing, will be interested to know that we have increased our facilities for producing Hacker boats under the personal supervision of their designer.

We have succeeded in pleasing the most discriminating class of boat buyers in the world. Among these we might mention Mr. Vincent Astor (2 Hacker runabouts), Mr. Payne Whitney (2 Hacker runabouts), Commodore Harrison B. Moore, of New York City; Commodore Percy K. Redick, of Albany, and many others who buy only the best and who are in a position to know what is best.

Hacker Runabouts are not stock boats in the ordinary sense of the word, but we have a number of standard designs from 20 ft. to 32 ft., which can be finished up to meet the requirements of the purchaser with speed guaranteed and every desirable quality insured by the results we have secured in former boats.

In writing for our illustrated catalogs of runabouts, hydroplanes or express cruisers, please outline your requirements.

Albany Boat Corporation, P. O. Box 530, Albany, N. Y.

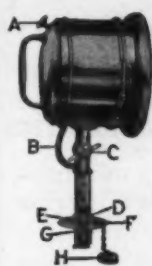


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A. S. CAMPBELL CO.  
BOSTON

## WIRELESS LIGHTING SYSTEM



Cello Searchlights operate on six ordinary dry batteries, or on storage, dynamo or generator, if you have the latter in your boat. They throw such a powerful light that you can read ordinary sized type 1,000 feet away from the light.

The Cello "Wire-Less" Searchlight, illustrated, is a great convenience, as there are no wires to connect or get water soaked. Price, Parcels Post Prepaid, \$7.50.

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286 Commercial St., Boston, Mass.

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You can buy a Palmer Engine of any type with the assurance that you are buying real service and genuine satisfaction. We are one of the oldest and most successful engine builders in the industry.

Palmer Engines are pioneers and leaders in every field. We built the first successful two-cycle engine made in New England. We have been building four-cycle motors for sixteen years. Every Palmer engine we have produced has been so good that we have never had to discontinue a model or a general type, merely adding improvements from time to time to keep our standard models a little ahead of the others.

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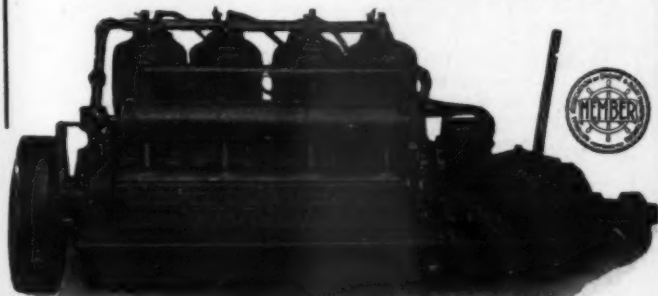
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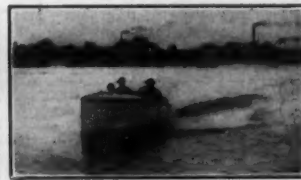
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**MARBLEHEAD ANTIFOULING GREEN**  
**Bottom Paint**  
 EMERALD GREEN LIGHT GREEN CREAM WHITE  
 FOR WOOD OR STEEL STAYS CLEAN



CRUISING IN WARM OR TROPICAL WATERS

**It is equal to copper sheathing as a protection against Teredos and far superior as an Anti-Fouler.**

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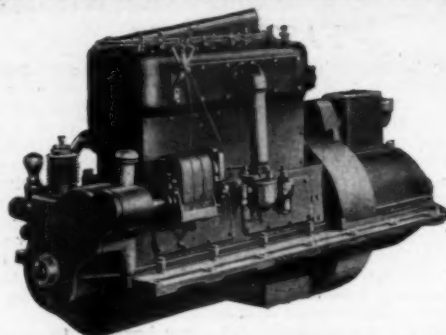
It is not a copper paint and is absolutely non-corrosive on metal.

Specified on new boats it is applied on the bare wood and is a powerful preventive of decay.

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The Motor of Renown  
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THE best designed four-cycle engine made. Strictly high-grade, modern throughout. Bosch ignition and Bosch electric lighting and starting system supplied. Furnished for burning kerosene, distillate or other low grade fuels, if so specified in order.

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The B & B Propeller must be unusually efficient for we have been making this money-back guarantee for the past seven years and have never had occasion to regret it. You can try one of our wheels without any chance of dissatisfaction or loss; we take all the risk.

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


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MOTORS.

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It isn't only the boat itself that draws admiration—good fittings are equally important. This point is often proved when a boat is being resold.

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—anchors, wheels, compasses, steerers, etc.—add to the appearance, convenience, and safety of a boat. It is made for long service, and has been giving complete satisfaction during the past 69 years.



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### An Engine With a Thousand Speeds

Stop your boat in half its length from top speed, at a touch of the control lever. Dock without slowing your engine. Troll at any speed with any type or size of boat. With the

1916  
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### New Reversing Propeller

you have more perfect control than an automobile. Simply shift the lever to the right speed and set the friction. No fixed notches in the quadrant to spoil perfect adjustment, when 1/16 of an inch in either direction (half the width of a notch) may mean a difference of a mile an hour in your particular boat.

Our 1916 model also carries the essentials which have made the Waterman Porto the leader for 11 years, and have given 32,000 users unqualified satisfaction.

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Propeller  
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Multiple  
Speed  
Control



"Sofia" 45, Bridge Deck Cruiser

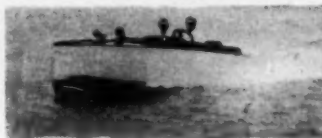
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20 miles per hr. guaranteed

12 h.p. 22 miles per hour

Specialize 3  
Qualities

"PLAIN"  
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AND "DE LUXE"

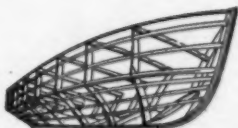


"San Marco," 22-ft. Runabout



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We build any kind of Cruisers, House Boats, Work Boats, Fast Passenger Boats, Runabouts, Speed Boats, Shoal Boats, Row Boats. Also furnish same, SEMI-ERECTED, KNOCK-DOWN and PLANKED HULLS.



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Finished Frame-V-Bottom

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THIS is a very special price to stimulate early building and has never been equalled for a frame of equal quality in a boat of this popular size and type. Investigate at once.



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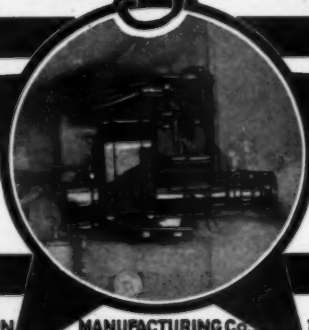


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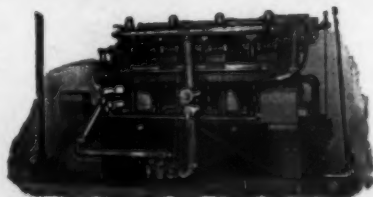
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**For MARINE SERVICE**

FUELS { KEROSENE (PARAFFIN)  
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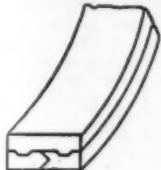
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Full power volume is dependent upon complete combustion of the whole fuel charge. In order to get the maximum power from the motor of your boat, you need Piston Rings that make the combustion chambers absolutely compression tight.

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eliminate the costly leakage of gas and oil and utilize the whole force of each fuel charge.

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Side Lock and Groove

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Awarded Grand Prize  
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Backed by 15 years' marine motor experience

The U. S. Government required a number of 3½ h.p. detachable row boat motors. Specifications were submitted by many manufacturers. In this keen competition—with Government Engineers as judges—the Wisconsin Motor won because of its mechanical design and quality of materials used in its construction.

Well-known row boat motors were exhibited at the Exposition, and the Wisconsin received the highest and only award.

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Let the judgment of Government Engineers and the Jury of Awards guide you to the best in row boat motors—the Wisconsin. These specifications—self-locking tiller, waterproof reversible high-tension magneto, water-cooled silencer, patented top adjuster—insure a smooth-running, powerful motor.

We know how to make row boat motors for we have built the highest grade of marine motors for 15 years. Send for special catalog of Inboard Marine Motors, 5 to 60 h.p.—1 to 6 cylinders.

Wisconsin Valveless Marine Motors. Built in 10 sizes—5 to 60 H.P.—1 to 6 cylinders.



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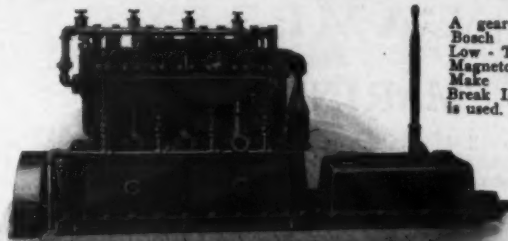
The Wisconsin Motor fits any row boat. Built for both fresh and salt water use. Develops full speed without loss of power. Economical—easy to operate. Thousands in use. Guaranteed to give satisfaction. Write for specifications and prices.

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Real heavy duty engines of the latest overhead valve type

The entire valve mechanism and camshaft can be removed without stripping the engine or taking off any other parts. The valve-in-head construction gives 20 to 25% more power than other motors of the same bore and stroke.



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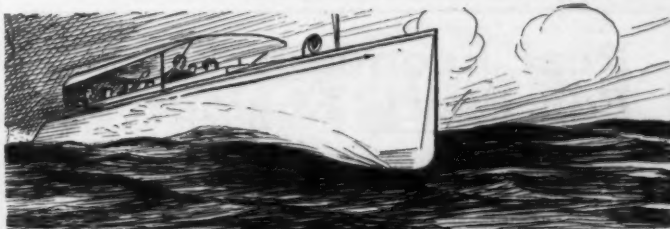
For those desiring to use kerosene fuel we supply two carburetors, one for gasoline and one for kerosene, with a separate generator for thoroughly gasifying the kerosene. The piston type throttle valve completely shuts off one fuel when the other fuel is being used.

Reverse gear with large spurs is built in and completely enclosed. No gears are in use on the forward drive. Large adjustable Ring Type Thrust Bearings.

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Write Today for Full Details of this Engine. Reliable Agents Wanted

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For discriminating boat owners there is only one kind of a craft that is satisfactory to buy, and that is a boat properly designed and carefully built by men who know how.

We have amply demonstrated that we know how in the many handsome Ackley Boats we have turned out in the past. There are many Ackley models but only one Ackley quality.

We build all sizes and types of high grade boats, power boats, hydroplanes, rowboats, canoes, folding portable boats, boat frames, planked hulls, and cruisers for southern waters, up to 50 feet long. V-Bottom boats are our specialty.

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Write us today for full information, specifications and prices. Or tell us how large and how fast a boat you want and let us submit our suggestions for your consideration.

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S. W. Corner Main & Water Sts., Cincinnati, Ohio

Agents for Red Wing Thorobreds and Scripps Motors.

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### CAMPBELL Four Cycle MARINE MOTOR

Campbell Motors are not offered in price competition with cheap motors, but they always prove in the long run to be the cheapest motors possible to install, cost of running, repairs, etc., considered. They are light in weight, simple in construction, noiseless in operation, strong and durable, and will start easily and run continuously under any weather conditions. In fuel consumption they are the most economical motors on the market.

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One, two, three, four and six cylinder motors for pleasure and work boats, from 5 to 60 H.P. distinctive open base construction. We also build Campbell High Speed Motors in 30-40 H.P., 75-100 H.P., and 100-125 H.P. sizes. Rowboat Motors, Lighting and Pumping Plants.

**"Buy a Campbell and Keep Going"**

Write today for Catalog giving complete information and letters from users

**Campbell Motor Manufacturing Co.**  
102 South Third St., Minneapolis, Minn.

## Real Economy For Every Engine

A Detroit Mechanical Force Feed Oiler means real economy because it is adjusted by the operator to feed exactly the amount of oil required—no more—no less.

This means a minimum of oil used for perfect results; but the *real economy*—the *big saving* is evidenced in the freedom from repair bills—the greater service and longer life of the machine.

### Detroit Mechanical Force Feed Oilers

are the best possible insurance against burned out bearings, scored pistons and cylinders, annoying delays and shut-downs due to faulty lubrication.



They are made in styles and sizes for every kind of gas—gasoline or oil engine, marine stationary or automobile. Equipped with pulley ratchet, gear or sprocket drive for easy installation on any engine.

Catalog P-64 giving full information gladly sent on request.

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DETROIT, U. S. A.

Canadian Detroit Lubricator Company Ltd.

Windsor, Ontario

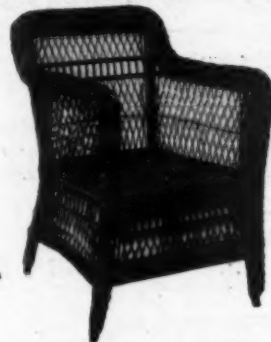
**Makers of the Stewart Carburetor**

## WICKER-KRAFT YACHT FURNITURE

For the better class of pleasure boats the suitability of the interior furnishings is fully as important a detail as the power equipment or the general plan of the boat. It is just as essential to the owner's pleasure, comfort and pride. And the difference in cost between the ordinary and the genuine Wicker-Kraft is so slight that there can be no reason for going without the best.

**WICKER-KRAFT IS USED ON THE FINEST BOATS.**

We are proud to number among our regular customers such well-known builders of high quality boats as Lawley, Seabury, Luders, Elco, St. Louis, Niagara, Fay & Bowen, Matthews, and many others of the same class. A list of the boats furnished with Wicker-Kraft would include many of the best known motor boats and finest yachts in America.



See Life Belt in Place

Wicker-Kraft Furniture is the correct thing for all sizes and types of pleasure boats. We have special designs for canoes, rowboats, express runabouts, launches, day cruisers and cabin cruisers.

The popular idea of enclosing a life preserver under the seat of the chair is an original Wicker-Kraft feature. All genuine Wicker-Kraft furniture has been designed and manufactured especially for boat use and is the most durable and comfortable furniture for marine service.

Write today for complete illustrated catalog and prices.

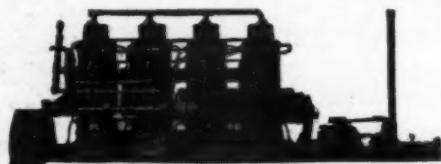
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**RUNS ON KEROSENE, FUEL OIL, CRUDE OIL,  
BENZINE OR GASOLINE**

NO batteries, wires, switches, timers, distributors, magnetos, or carburetors. NO TROUBLE. Easy to Start—Easy to Run.  
1, 2, 3 and 4 Cylinders.

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## Use Electric Lights For Your Home



Complete Plant  
Including En-  
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Switchboard, Batteries, Wire and Lamps.

**\$165.00**

Engine can be used for pumping water, etc.

**Schug Electric Manufacturing Co.**  
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is all you really need to know about the cruiser you buy

Behind this name lies the skill of twenty years of boat designing and building. Racinewis cruisers and motor boats are

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—by foreign governments, by institutions and individuals at home and abroad. In all Racinewis boats you will find safety, comfort and luxuriousness—combined with speed, power and dependability.

Write for catalog of cruisers, speed and semi-speed family launches, motor boats, rowboats and the famous Racinewis canoe. Mention your preference when writing.

**RACINE BOAT COMPANY**  
1615 Racine St., Racine, Wisconsin

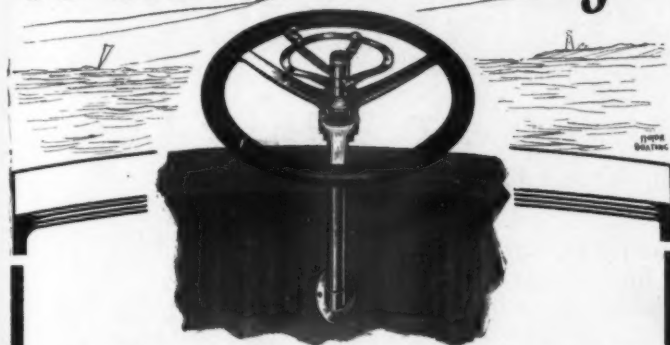


## 25 FOOT CABIN CRUISER

THE arrangement of this raised deck cruiser is very comfortable and convenient, it is able and seaworthy in heavy weather and it has an actual speed of  $9\frac{1}{2}$  to 10 miles per hour. There is a roomy cockpit aft, a comfortable cabin with 6-foot transoms, ice-chest, dish lockers, clothes lockers, drawers, and a separate toilet room forward. The construction is strong, the workmanship and finish of the highest class. The utmost care is taken with the engine installation. Perfect ventilation and freedom from noise, dirt and vibration are noteworthy features. The engine is completely out of the way, but instantly accessible either from the cabin or the cockpit.

**STEARNS & MCKAY CO.**  
MARBLEHEAD MASS  
U.S.A.

## A Factor of Safety



### "RELIANCE-ROCHESTER" STEERING WHEELS

AS the operation of your boat is governed by your steering wheel and engine controls, you will concede that "Perfect Control is Essential to Safety." "RELIANCE-ROCHESTER" Steering Wheels and controls add a factor of safety to your boat because they are made for absolute reliability.

Our wheels are used on the finest boats afloat. They are specified by prominent naval architects and used exclusively by many of the best known boat builders. Twenty-five different styles to choose from—the right wheel for every boat.

Among the well known users are:

"Peter Pan VII"	"Vitesse"	"Miss Detroit"
"Prunes"	"Majona"	"Tech, Jr."
"Napu" "Question"	"Curlew"	"E. L. S."
"Watch Your Step"	"Narona"	"Racoon"
"Nankeypoo, Jr."	"Romary"	"Betty"
"Roslyn, Jr."	"Kiota III"	"Intruder"
"Mystery II"	"Ruira"	"Ethel Dale"
"R. I. L."	"Vlie"	"Isabelle"
"Eleanor"	"Ginger"	"Neutral"
"Margaret"	5 Torpedo Retrievers, U. S. N.	

Specify a "RELIANCE-ROCHESTER" for your new boat.  
Write for Catalog.

W. S. HALL CO. 17 Elm Street, Rochester, N. Y.

## MORRISTOWN Marine Motors

The Highest Quality Motor  
of Its Size and Price  
Made in America

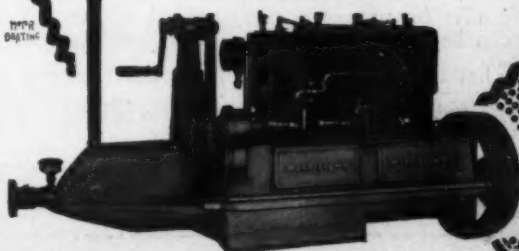
That is a pretty strong statement, we admit, but we have the courage of our convictions and invite the most searching investigation, and comparison with any other motor of similar power, regardless of price.

Look at the brief list of features. The many others which we haven't room to mention, including quality of materials and workmanship, you will find equally satisfactory. Light enough for a hydroplane, fast enough for an express runabout, powerful enough for a cruiser.

Weight, 525 lbs., complete; aluminum crank case; heavy crank shaft; heavy flywheel; large bearings throughout; die cast nickel babbitt bearings with laminated shims; manganese bronze connecting rods; one-piece cam shaft, easily removed; high tension dual magneto; rotary gear water pump; constant level splash lubrication with gear oil pump; Joe's reverse gear on base; rear starter; Schobler carburetor; many other features.

Write today for comtescription.  
Two Cycle Motors 4 to 15 H. P.

**Morristown Boat & Engine Works**  
MORRISTOWN, N. Y.



# Are You Satisfied?

Now that the season is almost over, stop a minute and consider whether your engine has run as smoothly this year as you would like to have it. Are you satisfied? Do you get as much power and speed, and as good economy as you used to get? Can you afford to get along with 50% or 75% efficiency, when for a few dollars more you can get 100% efficiency, at least in so far as carburetion is concerned? Perhaps all you need is a

## KINGSTON "ENCLOSED TYPE" CARBURETOR

A new Kingston Carburetor puts a degree of snap and vim into your engine that you can secure in no other way. Simply the feeling that the engine is doing better is worth all it costs, to say nothing of the improvement in fuel economy and many other advantages. It is made for all sizes and types of engines.

This carburetor is absolutely up-to-date—designed for the poor grade of gasoline we all have to use these days. Remember, the gasoline used three to five years ago was so much more volatile and easy to vaporize that a carburetor designed for that fuel is utterly inadequate today.

Let us prove what a Kingston will do for you at our risk. If it satisfies you, you will want it. If it doesn't, you lose nothing. Put it up to us.

*Write today for price, trial offer and guarantee.*

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# NIAGARA RUNABOUTS

## SEE US AT THE NEW YORK SHOW

Our exhibit at the New York Motor Boat show is your opportunity to examine the quality of design, construction and finish which has won such popularity for Niagara Motor Boats during the past few seasons. Don't fail to look us up while you are at the show. You are invited to make our booth your headquarters.

If you are looking for a comfortable family runabout of the highest quality and most up-to-date construction, you will enjoy inspecting the boats we have on exhibition. They are representative of the highest development in recent marine construction.

Among our customers we number some of the most prominent and most discriminating boat owners in America.

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Mr. James A. Stillman, of the National City Bank, New York,  
Mr. W. S. Benson, vice-president of the Tidewater Oil Co., New York,  
Mrs. Whitelaw Reid and  
Mrs. Anson Phelps Stokes of New York are owners of Niagara boats.*

We offer for prompt delivery several of the well known Niagara Runabouts which can be equipped and powered to suit the taste of the buyer.

We build all Types of Motor Boats and Cruisers.

Write today for full information and prices.

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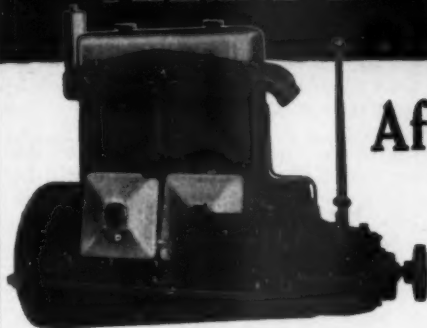
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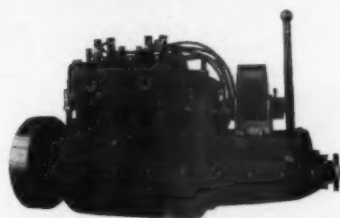
# FERRO

## MARINE ENGINES



**The Ferro Four-Cycle for Medium Duty**

Four Cylinders: H.P. 35-50; R.P.M. 700-1000; Bore, 4 inches; Stroke, 6 inches.  
Six Cylinders: H.P. 25-40; R.P.M. 700-1000; Bore, 4 inches; Stroke, 6 inches.



**The Ferro Four-Cycle for Light Duty**

H.P. 10-14; R.P.M. 1000-1400; Bore, 2 1/2 inches; Stroke, 4 inches.

## After the Builder---What?

Under the hand of the builder, the boat takes shape. But whatever his skill, whatever the construction of the boat, the fulfillment of your hopes and plans rests with the engine.

The Ferro Four-Cycle line represents the latest development in marine engine construction. The two larger sizes, four and six cylinders, designed for medium-duty, have detachable heads, overhead valves, removable cylinder sleeves, mono-bloc castings and additional features that assure accessibility, unusual freedom from vibration, minimum wear and tear, absence of leaks, and other advantages. All moving parts are enclosed, keeping them free from dirt and assisting in preserving that clean appearance for which, among other things, these engines are known.

The smaller four-cylinder engine of the Ferro Four-Cycle group—built for fast light work—is offered this year for the first time. It is clean, compact, handsome and powerful.

Send for Catalog 2104. Use the Coupon.

### Many Other Ferro Models

The Ferro 2-cycle line affords choice of eleven power plants from 3 H.P. to 25 H.P., all of which will be equipped with kerosene carburetor, if desired. Fully described in Catalog 2102.

In rowboat, canoe, dinghy or dugout, the Ferro Rowboat Motor is a great improvement over the old-fashioned hand-oar method. Ask for Catalog 2101.

Send me full information about:—

(Check Item or Items.)

Four Cycle—Medium Duty  
Four Cycle—Light Duty  
2-cycle, 3 H.P. to 12 H.P.  
2-cycle 15 to 25 H.P.  
Kerosene Engines  
Rowboat Motor

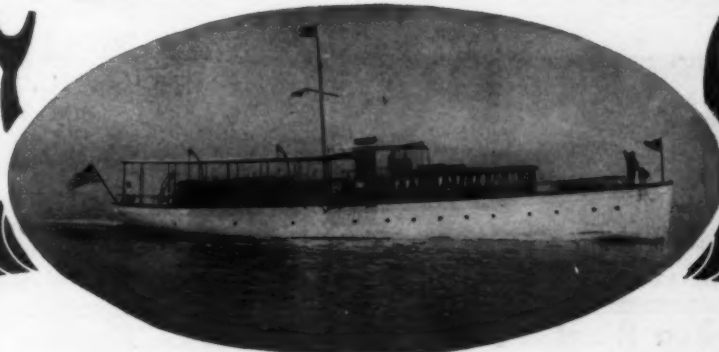
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The Ferro Machine & Foundry Company, 210 Hubbard Avenue, Cleveland, Ohio

# LAWLEY



# BOATS

## Half a Century of Success—and Its Foundation

This year the Lawley organization completes its fiftieth season of successful yacht building. For us this fact has, of course, a sentimental value. For the prospective buyer it has a practical business value.

The perfect quality of every Lawley Boat has made it possible for this firm to survive the test of time, with a steady and ever increasing growth. Every boat produced has helped to build the business into the biggest of its kind in America.

Lawley success, builded on a basis of quality alone, is a safe guarantee of complete and lasting satisfaction for Lawley patrons. Lawley experience and Lawley facilities are further guarantees that every Lawley Boat will be, when completed, just what was intended in the original plans.


We build motor boats, tenders, life boats, cruisers, auxiliaries and yachts of all sizes and types. We have the largest and best equipped plant for this work in America. These superior facilities promote both quality and economy. We also build steam power plants, and Lawley, Four-Cycle, Heavy-Duty Motors.

Let us submit some ideas for your next boat. Illustrated Catalog on request

## Geo. Lawley & Son Corp., Neponset, Mass., U. S. A.

ESTABLISHED 1866

Cable Address "LAWLEY BOSTON"



# MOHAWK MOTORS

## The Motor That Makes Motor Boating a Pleasure

Built to operate on either Kerosene or Gasoline

If you want a simple, inexpensive two-cycle engine that is built with all the care that is devoted to the most expensive four-cycle engines—and that equals the four-cycle in every detail of performance—you will be interested in the Mohawk Motors. Instead of trying to see how *cheap* we could make them we have succeeded in proving how *good* we can make them.

For motors of small and medium size, the Mohawk two cycles have every advantage over all engines of the complicated four-cycle type. They are simple, compact, easy to care for, inexpensive to buy and economical to run. They are as reliable and durable as any engine can be made.

It is all because we put the right materials into the Mohawk and build it as a good engine should be built. We use double ignition, an auxiliary air intake, extra large valve parts, four rings on each piston and many other features that cost a little more to manufacture, and are worth a lot more in service.

Mohawk Motors are built for racing boats, for medium duty, and for extra heavy duty service. Each type is especially designed for its particular work. Whichever type you select, it will stand up and make your boating a pleasure.

Two-Port Type Kerosene-Gasoline	Combination Two-Three Port
1 Cylinder, 6 H. P.	1 Cylinder, 5-6 H. P.
2 Cylinders, 12 H. P.	1 Cylinder, 7 H. P.
4 Cylinders, 25 H. P.	2 Cylinders, 10-12 H. P.
	2 Cylinders, 14-20 H. P.
Three-Port Type	3 Cylinders, 15-21 H. P.
1 Cylinder, 3 1/2 H. P.	3 Cylinders, 21-30 H. P.
1 Cylinder, 6 H. P.	
2 Cylinders, 7 H. P.	

Write us today for the latest Mohawk catalog. Tell us what power you want and let us quote prices.



S-R Manufacturing Co., INGERSOLL AVE.  
SCHENECTADY, N. Y.

## RICHARDSON BOATS

This handsome 25-footer is our leader for the 1916 season. An up-to-date V-bottom design, finished up in the best of style and built to give remarkably good speed and comfortable riding with any power and in any kind of sea.

You will be surprised to learn the low price we have been able to set for this model, by specializing on this one size and type. It cannot be equalled for handsome appearance or satisfactory service at the price. Early deliveries.

We build everything in the boat line, K. D. or complete. Get in touch with us before you place your order. Write today for complete information.

**RICHARDSON BOAT CO.,**

### 25' x 5' 10" RUNABOUTS

OUR SPECIALTY FOR 1916



Sweeney Street, No. Tonawanda, N. Y.

*If You Want a Friend that Will Stick Forever, Try*

## JEFFERY'S MARINE GLUE

In some places economy is alright, but when you come to Marine Glue the difference in cost between the ordinary and the best is so little that you can't afford to take the risk of having to do the job over again for the sake of saving a little on the material.

It pays to use Jeffery's in the first place, every time. Jeffery's is universally conceded to be the best and most reliable marine glue. Jeffery's Glues are specified by the best designers and used by the best builders. A little investigation will show you why.

No. 1—Extra Quality for Deck and Hull Seams of Yachts and Motor Boats. Black, white, yellow or mahogany color. Give black the preference; it is more elastic and satisfactory in every way.

No. 7—Soft Quality for Waterproofing Canvas, for Covering Decks, Tops of Cabins, Canvas Boats, Canoes and Flying Boats. Black, white or yellow. With a coat of paint once a year it will last as long as the boat.

Waterproof Liquid Glue is used for the same purposes as No. 7, Soft Quality. Ready for use and requires no heating; simply open the can and paint it on. Especially recommended for waterproofing canvas covering of flying boats, and for wing surfaces. Will also attach canvas, cork, felt, rubber, leather, and linoleum to iron, steel, or wood.

Special Marine Canoe Glue. Best Filler for Canvas. Black, White and Yellow. Every canoeist should carry one of our 25c emergency cans. Sent by mail on receipt of 30 cents in stamps.

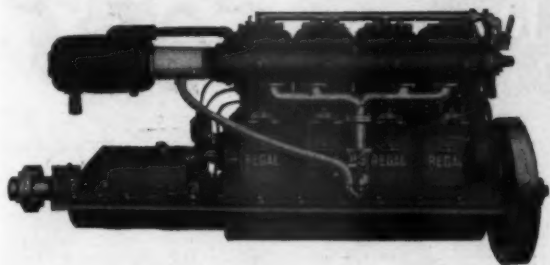
FOR SHIP'S DECK USE No. 2 First Quality Ship Glue. No. 3 Special Navy Glue. Put up in 1, 2, 3 and 5 lb. cans; also 14, 28, 56, 112 lb. boxes.

Sold by all Boat and Canoe Supply Houses, Hardware and Sporting Goods Dealers.

Write today for booklet "What to Use and How to Use It." It contains a fund of valuable information that every practical boat owner and builder should know.

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# REGAL

The Leader in Value and Quality

## For 1916

During the past fifteen years Regal Engines have been in the first rank of the world's most efficient and reliable boat engines. They have established an enviable reputation for combining worthiness with reasonable prices.

With the 1916 line of Regal Engines more surprising values are offered than ever before. Each engine has many more refinements in construction than the model preceding, yet its price is lower.

## REGAL GASOLINE ENGINE CO.

74 W. Pearl Street  
COLDWATER MICH.



Any Regal Engine will be constructed to burn kerosene or coal oil at no additional charge.

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4 H.P., 4	$\times 4\frac{1}{2}$	One-cylinder	.....	\$96
8 H.P., 4	$\times 4\frac{1}{2}$	Two-cylinder	.....	223
16 H.P., 4	$\times 4\frac{1}{2}$	Four-cylinder	.....	402
32 H.P., $4\frac{1}{2} \times 5\frac{1}{2}$		Four-cylinder	.....	574

### MEDIUM SPEED

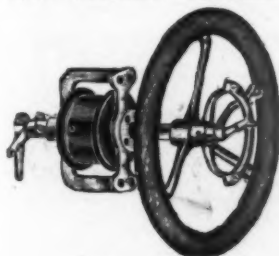
5 H.P., $4\frac{1}{2} \times 5\frac{1}{2}$		One-cylinder	.....	\$128
10 H.P., $4\frac{1}{2} \times 5\frac{1}{2}$		Two-cylinder	.....	307
20 H.P., $4\frac{1}{2} \times 5\frac{1}{2}$		Four-cylinder	.....	480
7 H.P., $5\frac{1}{4} \times 6\frac{1}{2}$		One-cylinder	.....	217
14 H.P., $5\frac{1}{4} \times 6\frac{1}{2}$		Two-cylinder	.....	381
30 H.P., $5\frac{1}{4} \times 6\frac{1}{2}$		Four-cylinder	.....	670

### SLOW SPEED

9 H.P., $6\frac{1}{2} \times 7$		One-cylinder	.....	\$280
18 H.P., $6\frac{1}{2} \times 7$		Two-cylinder	.....	521
36 H.P., $6\frac{1}{2} \times 7$		Four-cylinder	.....	989
50 H.P., $7\frac{1}{2} \times 9$		Four-cylinder	.....	1310

Without propeller equipment. Bosch magneto installed on the two- and four-cylinder engines.  
F. O. B. Cars, Coldwater, Mich.

### NEW "EUREKA" STEERER



Price \$6.49

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Pol. Brass, Ea., \$0.12

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Pol. Brass, \$1.50

### ELECTRIC LIGHT FIXTURE



6 V., 6 C.P.,  
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1 Cyl., \$2.50; 2 Cyl., \$2.75; 4 Cyl., \$3.25

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ELECTRIC DETACHABLE COMBINATION BOW AND STERN LIGHTS

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Marine Supplies at Money Saving Prices

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### WILCO MOTOR BOAT SWITCHBOARD



Price \$8.95

### ELECTRIC PULL SWITCH FIXTURE



6 V., 6 C.P.,  
\$1.75

### "MITCHELL" COLLAPSIBLE SEAT



Entirely New,  
Piano Finish,  
Extra Strong  
Spar, Coated,  
Guaranteed.

Diam. 11"; Pol. Oak, \$2.25

### ELECTRIC SWITCH



3 Pull, \$1.13  
2 Pull, .75  
1 Pull, .38

### ELECTRIC SEARCHLIGHT



8 1/2 In. Front, \$9.75

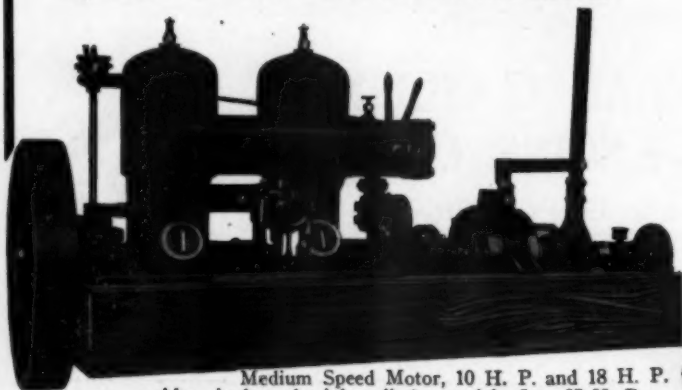
# PUT REAL VIM IN YOUR BOAT

There isn't much pleasure in driving a boat that hasn't all the snap and power you want. If yours is in this class don't blame the boat, but install one of our new

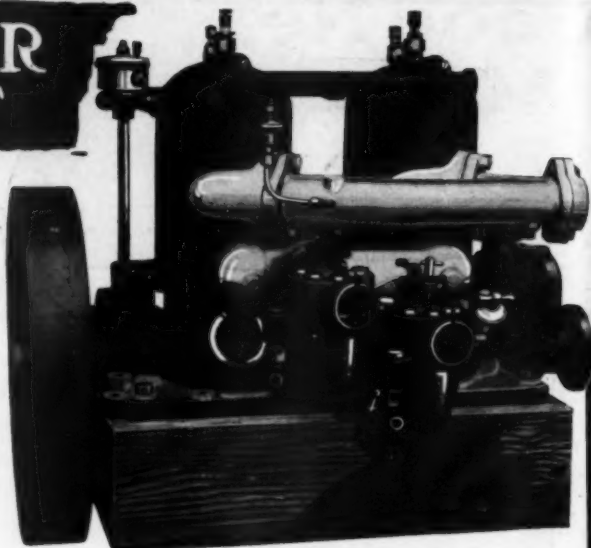
## VIM MOTORS

Vim Motors put real vim into a boat. They are built in three distinct types for three distinct kinds of service—medium speed for regular work, "Cyclone" speed type for fast boats, and special heavy duty for hard working boats.

All models are two cycle, three-port valveless type and in competitive tests we have invariably found that Vim Motors give considerably more power on less fuel than any other motor of the same bore and stroke.



Medium Speed Motor, 10 H. P. and 18 H. P.  
Also single and triple cylinder models, 5 to 27 H. P.



Cyclone Speed Vim Motor, 13-15 H. P. and 24-25 H. P.  
Three Cylinder Model—19-23 H. P.

### TEN YEARS' GUARANTEE

It isn't often that you will find a manufacturer who is willing to back his product for ten years. But this is just one of the features typical of the whole Vim proposition. The Vim story is too big and too important to be covered in one ad like this. Let us tell you the rest of it. If you ever expect to buy another engine, perhaps you will learn something worth knowing from our handsome new catalog. Write for a copy today. It is free.

**THE VIM MOTOR CO.** 2802 WATER STREET  
SANDUSKY, OHIO.

### Announcement

The undersigned corporation has acquired the shops, yards, staff, and good will of the Saint Louis Yacht & Boat Company, builders of "SAINT LOUIS CRAFT," and of the Milwaukee Yacht & Boat Company, builders of "X-CELO BOATS" and will henceforth devote its energies to the construction of thoroughly standardized runabouts and cruisers of modern design and of especially designed boats of all sizes and types up to two hundred feet in length.

#### Stock Models

16' 2-passenger, 18' 4-passenger, 21' 16-passenger, 26' 8-passenger and 30' 16-passenger runabouts; 31' 12-passenger and 36' 14-passenger express runabouts; 31' hunting cabin

**GREAT LAKES CRAFT**

GREAT LAKES BOAT BUILDING CORPORATION

cruisers, 31' express cruisers, 36' auxiliary cruisers, 40', 45' and 48' military type express cruisers, 45' raised deck cruisers, 50' Florida cruisers and 48' day express boats. Appropriate bulletins will be sent upon request indicating size and type desired and number of passengers and speed.

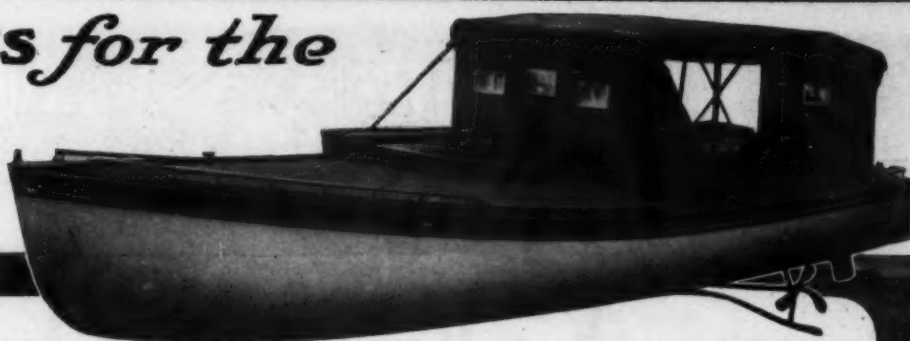
Our Milwaukee shops, yards and marine railway are among the best in the United States. The policy of the corporation is to produce only the best, and thru shop and organization efficiency and large production to reduce the cost to a minimum.

**Great Lakes Boat Building Corporation**  
Greenbush and Becker Streets and Kinnickinnic River  
MILWAUKEE, U. S. A.

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## Good News for the Motor Boater



You can now get the same reliability, efficiency and service in a 16-footer that could ordinarily be had only in the larger and more expensive boats. A Mullins-Universal 4-cycle, 4 cylinder 7 H.P. Motor with Berling magneto, ignition and reverse gear can now be had as regular equipment with any Mullins boat—18, 20, 22 or 24-foot length—exclusive Whittelsey models.

This big improvement has been made possible by twenty years of knowing how and the Mullins method of construction and power installation and specializing on certain models.

No advance in prices. Prompt deliveries. Every boat guaranteed—as usual. More than 60,000 Mullins boats now in service.

You should have Mullins' hand-somely illustrated catalogs—describing over forty models of power boats, rowboats and canoes—free on request.

**THE W. H. MULLINS COMPANY**  
714 Franklin Street  
Salem, Ohio  
World's Largest Manufacturers of Steel and Wooden Pleasure Boats

# MULLINS

STEEL BOATS CAN'T SINK

## MATHIS priority in the houseboat field

has led some few people to overlook the unexcelled equipment of this yard for the building of



**ENCHANTRESS**, a 75-foot double-plank mahogany cruiser built for Louis Burk, Philadelphia.

### SPEED BOATS

Naval Architects of discrimination have not done this—here are four recent speed boats, built by us, all designed by Bowes & Mower, Naval Architects, Philadelphia.

Send us your plans and specifications to figure on.

**Mathis Yacht Building Co.**

COOPER'S POINT  
CAMDEN, - N. J.



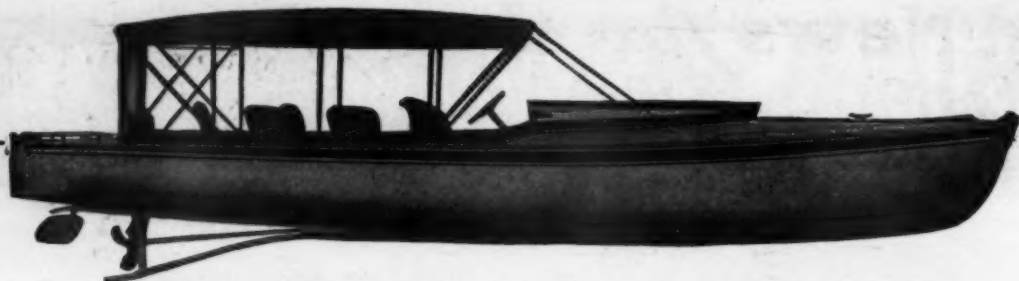
**AKBAR**, a 72-foot double-plank mahogany cruiser built for George W. Childs Drexel, Philadelphia.



**LADY BALTIMORE**, a 75-foot speed boat built for the Hall-Seeley Motor Co., Baltimore, Md.



**ACE**, a 50-foot, high-speed, double-plank mahogany runabout built for George W. Childs Drexel, Philadelphia.



## K-E-N-Y-O-N

*Still Means the Best in Boat Tops*

The two big features that you will like about the KENYON Top, are its style and durability. Kenyon Tops and Cockpit Covers are made to order to fit your boat. Light, flexibly strong, waterproof material—rustless enamelled, steel tube frame—fold easily and quickly. One-man side curtain type.

Why experiment when you can be SURE?

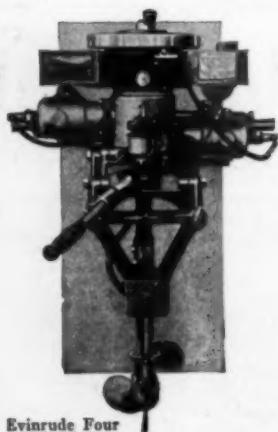
KENYON Tops cost no more than the ordinary kind. If you own a boat, or expect to own one, you will enjoy reading the Kenyon Boat Top and Cushion catalog. Free on request.

Kenyon Cushions and Pillows filled with Kapoc, stand for boat luxury. Kapoc is a silky vegetable fibre that comes from the South Sea Islands and retains its resiliency for years.

Kenyon Cushions and Pillows are light in weight, really handsome in appearance and are *real life preservers* in an emergency.

# THE R. L. KENYON COMPANY

500 Meadow Street, Waukesha, Wis.



Evinrude Four-Cycle Twin.

## - A New - EVINRUDE

More speed, more power, are yours in the Evinrude Four-Cycle Twin! Eight to nine miles an hour in an ordinary rowboat—smooth, quiet running, with no vibration! The Four-Cycle Twin “picks up” quickly and has remarkable flexibility.

The Automatic Reverse and the Evinrude Magneto—Built-In Fly-Wheel Type—are used, also the other conveniences and safeguards of the single-cylinder models.

In the single-cylinder, two-cycle Evinrude there are several important improvements for 1916 in addition to the features and conveniences already well known. There's more speed, and the magneto is entirely insulated and waterproofed, furnishing perfect ignition always, no matter how drenching the rain or how heavy the spray.

See the New Evinrude Models at the New York Show

Write for New Evinrude Catalog, with complete descriptions.

## EVINRUDE MOTOR CO.

435 Evinrude Block

Over 60,000 Sold

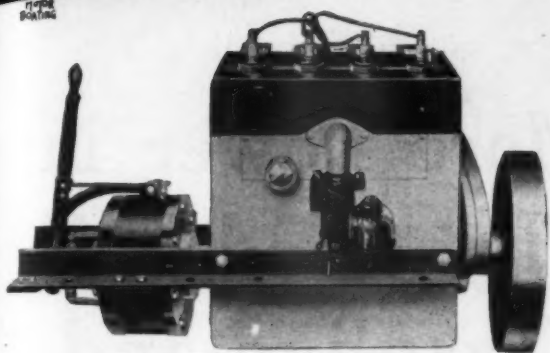
Milwaukee, Wis.



Evinrude Single-Cylinder Model A



# See These Wonderful Engines at the Show



The most sensational development ever introduced into the marine field—not a freak engine with "original" and impractical ideas, but a high-class, four-cycle power plant with thoroughly standard design, advanced construction and fine materials.

## Four Cylinder, Four Cycle, 15 H. P.

With Reverse Gear, \$125 Complete; Weight, 180 Lbs.  
Without Reverse Gear, \$110 Complete; Weight, 150 Lbs.  
Including Splitdorf Dixie Magneto, Carburetor and Spark Plugs.

## Eight Cylinder, V-Type, 30 H. P.

With Reverse Gear, \$250 Complete; Weight 290 Lbs.  
Including 2 Splitdorf Dixie Magnets, Carburetor and Spark Plugs.

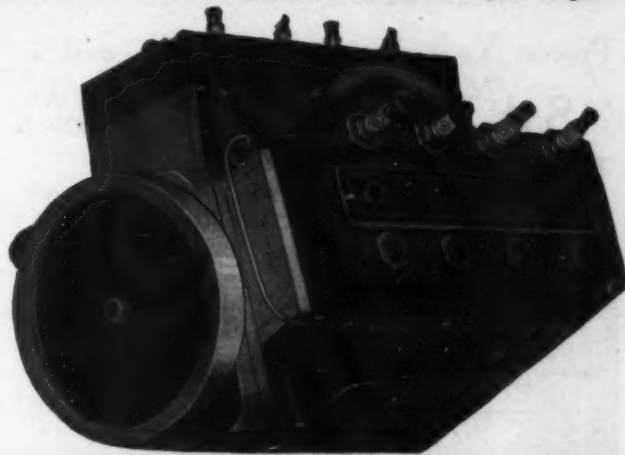
These are the lightest, simplest and lowest priced motors of their piston displacement ever designed. Bore,  $2\frac{3}{8}$ ". Stroke, 4". Built to operate at 200 to 1800 R.P.M.

The low prices and light weight are due solely to simplicity of design—not cheapness of construction. We use High Duty Roller Bearings for main bearings,—drop forged, heat treated and ground crank shaft, integral ground cam shaft, block cylinder castings, drop forged steel connecting rods, and vanadium steel piston pins. Positive and reliable lubrication.

Don't Fail to See Those Engines at the Show.  
Write today for full description.

## ABLE ENGINE CO., Inc.

405-42nd STREET BUILDING NEW YORK CITY



**VIPER**  
Trade Mark Reg.  
U. S. Pat. Off.

# VIPER SEA SLED

HICKMAN PATENTS

**SEA SLED**  
Trade Mark Reg.  
U. S. Pat. Off.



24-foot Standard Sea Sled running at 35 miles per hour

To-day no man is informed concerning motor driven boats capable of any speed unless he has learned what we have to say.

Bulletin No. 18, by Mr. Hickman, just published, gives information that is not available elsewhere.

Would it surprise you to learn that not only has the Sea Sled every other advantage over the older type of boat, but that it is already more efficient?

**Murray & Tregurtha Co.**  
340 West First St., South Boston, Mass.

**Viper Co., Ltd.**  
Pictou, Nova Scotia, Canada

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.

# SAFETY FIRST



You may cruise around for twenty years without a single fire or serious accident—and then within twenty minutes your boat may be burned to the water's edge, with you and your family struggling in the water, perhaps miles from land and no one around to rescue you. If you stopped to think about this, would you take the chance—for the sake of \$9.00 or \$10.00?

## Protect Yourself and Your Boat with a "SAFETY-FIRST" Fire Extinguisher



As long as there is a conscious man, woman or child aboard it will be impossible to have a serious fire. Next to building your boat entirely of metal and asbestos with nothing combustible aboard, there is no other way of making it more nearly 100% fire proof.

This is the most reliable type of fire extinguisher ever invented. *Approved by the Board of Steamboat Inspection Service.* Effective for gasoline fires and electrical fires—the most difficult kind to extinguish—and, of course, for all other kinds of fires.

This is a *constant pressure* chemical extinguisher. Weighs only about 11 lbs., so anyone can handle it. The contents—2 quarts—are sufficient to put out any fire if used promptly. Always ready for use, it extinguishes the fire before it gets beyond control or does any damage.

You simply turn a valve and point the hose—as easy as pointing your finger. Stream carries 35 feet. No pumping—which by the way is practically impossible when you are excited. The chemical is non-corrosive, non-poisonous and non-injurious. The container is all metal—no rubber or leather to rot or wear. Cylinder is 18-gauge seamless brass, with phosphor bronze ends, metal valve and flexible metal hose. Tested for 300 lbs. pressure. Diameter 4". Height 16".



Red Enameled, \$9.00      Nicked Plated, \$10.00  
Lacquered Brass, \$10.00

Order a "Safety-First" Today

Dealers and Jobbers: Get our discounts and proposition at once. Big profits for you. Write or wire today.



**HANSEN-NIETER  
SAFETY CO Inc**

103 Park Ave., New York City

# Going South?

THERE IS

## More Power in That Good Gulf Gasoline and Supreme Auto Oil

You can always find a Service Station along the Florida Coast that will supply you with these sterling products.

If you touch any of the ports listed below, be sure to Look for the Sign of the Orange Disc.

Fernandina  
Jacksonville  
St. Augustine  
Daytona  
New Smyrna  
Titusville  
Cocoa  
Eau Gallie  
Fort Pierce  
Stuart  
West Palm Beach  
Ft. Lauderdale  
Miami  
Key West

Ft. Myers  
Punta Gorda  
Sarasota  
Bradentown  
Tampa  
Port Tampa  
St. Petersburg  
Clearwater  
Tarpon Springs  
Cedar Keys  
Carrabelle  
Apalachicola  
Panama City  
Pensacola

## Gulf Refining Co.

*The largest independent refining company in the world*



# Kyanize

KY-AN-IZE

## Waterproof Spar Finish



It will not crack, soften or check. It will not turn white or blue—either in or out of salt or fresh water. It will stand a blistering sun, rain, snow, heat or cold.

The right varnish for motor boats, yachts, canoes, deck fittings, all exterior woodwork.

Every gallon guaranteed. Used by the thousand gallons in the U. S. Navy. Try it.

# Kyanize

KY-AN-IZE

## White Enamel



is different from the white paint you've been using. Kyanize White Enamel will wear longer, look better, is whiter and will add more speed to your boat. This is the Enamel used on

the high grade boats. Best for all white work on wood or metal. Leaves a durable, high gloss finish—easily cleaned. It will not crack, chip or peel. And we refund the money for the empty can if it does not do all we claim.

If there is no Kyanize Agent in your town, don't take something "just as good." Write us direct.

**Boston Varnish Company**

Everett Station, Boston, U. S. A.

Chicago  
Warehouse and Office  
519 West Twelfth St.

San Francisco  
Warehouse and Office  
311 California St.



## "NORMA" BALL BEARINGS

(Patented)

As you examine boats, and investigate, and compare—at the Motor Boat Show or elsewhere—look well to the ignition apparatus offered. For—from the standpoint of service and pleasure—the best boat is no better than its engine, and the best engine no better than its ignition. Look carefully, then, to the magneto. Consider well its trouble-proofness, its wear-proofness, its service capacity, its dependability. Here is a hint for those who would be magneto-wise.

The high-grade magnetos that have a nation-wide reputation for reliability—both in the motor boat and automobile fields—use "NORMA" Ball Bearings as standard equipment. Boat buyers, boat builders, and engine manufacturers, then, may look upon "NORMA" Bearings as a distinguishing feature of reliable ignition apparatus.

Have You the "NORMA" Catalog?

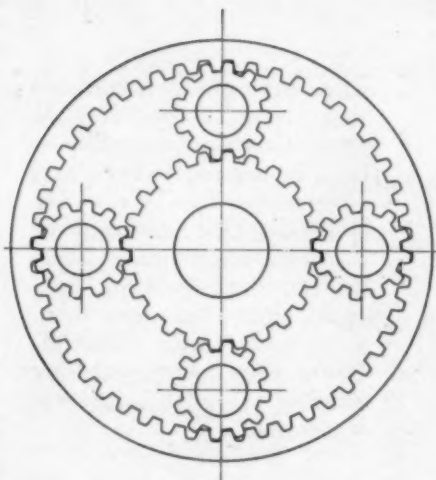
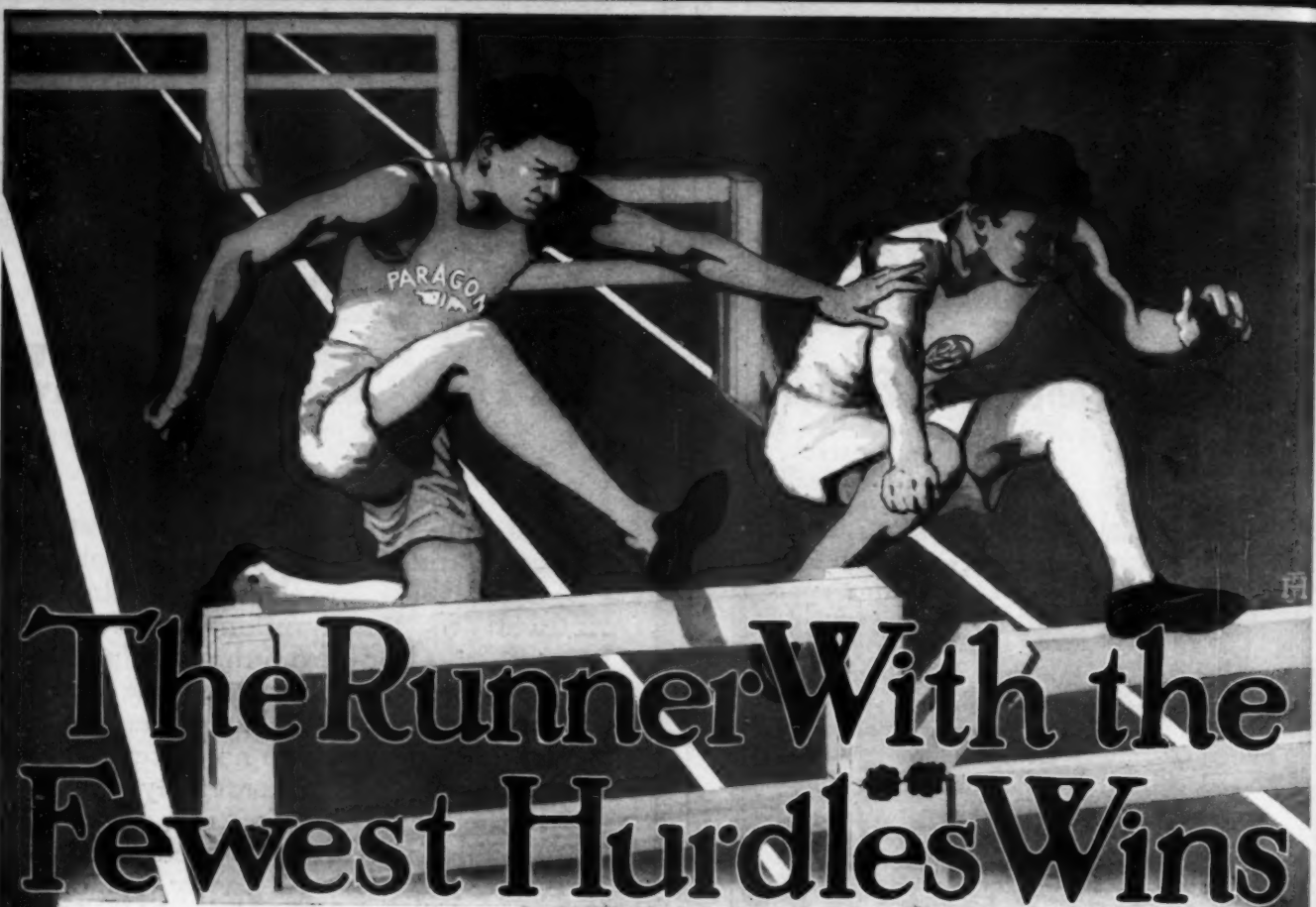
**THE NORMA COMPANY OF AMERICA**

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust, Combination Bearings





Every time a runner takes a hurdle, he loses time and *strength*—wastes *power* as it were. Just as a reverse gear which is obliged to transmit its power through a *number* of staggered pinions.

In every transmission employing gearing some power must be lost. Good engineering practice demands the transmission of power in as *direct* a line as possible—through the *fewest* number of pinions. Power which is made to jump from pinion to pinion around corners *spends* itself—just as a runner loses strength and power by being made to jump hurdles.

PARAGON Reverse Gears are the only gears using the *direct line drive* on the reverse. Look at the illustration at the left. Note that the motor's power is transmitted from the engine gear direct to the propeller gear through four pinions, each equi-distant from the center and distributing the load *evenly*. See the direct, *short* line the power travels. Remember, too, that here on the reverse is where you want plenty of power—and you want it *quick*.

Now, take any other reverse gear and examine its method of transmission. See how many *corners* your power has to turn—note how every other gear construction makes your power travel farther and turn *corners*—makes it *jump hurdles*.

This is only one of the many points in PARAGON construction that has led nearly all the high grade marine engine manufacturers in the country to adopt PARAGONS as regular standard equipment for their motors. No other reverse gear has these exclusive PARAGON features. That's why we urge you to look carefully at the reverse gear on the motor you expect to buy. It is worth while for you to insist that your new motor shall be PARAGON Geared.

SEND FOR BOOKLET AND OTHER PARTICULARS

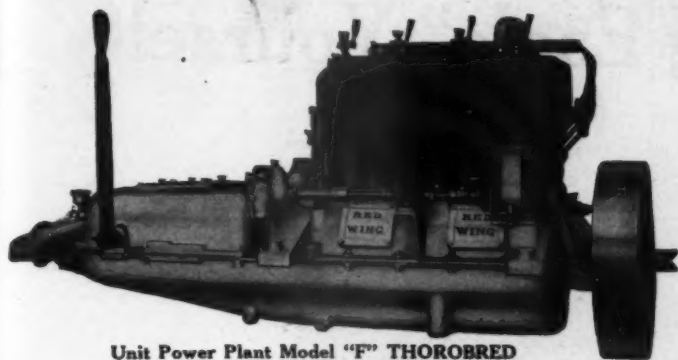
PARAGON GEAR WORKS, Cushman St., Taunton, Mass.

EVANS STAMPING & PLATING CO.



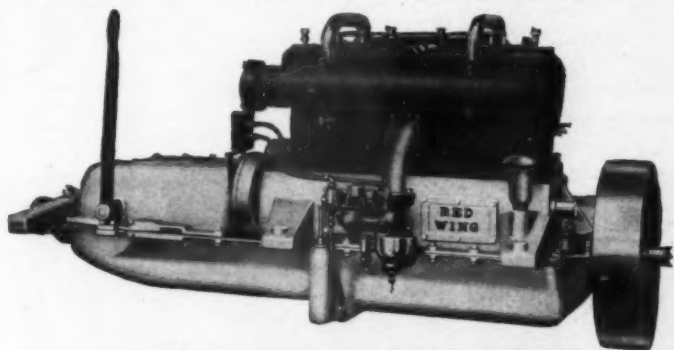


**Red Wing Thorobred**  
THE MOTOR WITH POWER TO SPARE



Unit Power Plant Model "F" THOROBRED  
28-36 H.P., 4 1/16 x 5"  
Furnished with or without Unit Power Plant

octopus. Then the hot bulb—with its history of curses and brain storms. Nor was the era of experimentation over when arrived the two-cycle motor with its woman's temperament and donkey stubbornness. There's just one good thing about the two-cycle—it teaches



Unit Power Plant Model "B" THOROBRED  
32-40 H.P., 4 1/2 x 5"  
Furnished with or without Unit Power Plant

est example. It's a strong statement, we know, but we are there with the proof if you are ready to be convinced. You cannot buy a better motor—and we have sizes and prices to meet your desire.

*A post card will bring full information.*

Five Sizes for 1916:

Model A—3 1/2 x 4 1/2", 14-20 H.P. Price, \$180 and up.  
Model AA—3 3/4 x 4 3/4", 18-24 H.P. Price, \$210 and up.  
Model H—3 3/4 x 5 1/4", 25-33 H.P. Price, \$250 and up.  
Model F—4 1/16 x 5", 28-36 H.P. Price, \$285 and up.  
Model B—4 1/2 x 5", 32-40 H.P. Price, \$350 and up.

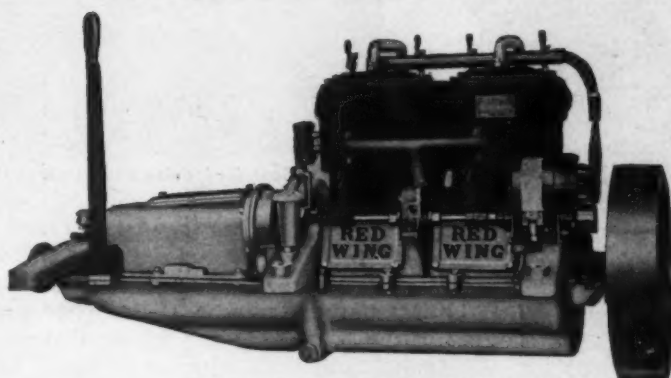
**RED WING MOTOR COMPANY Dept. B. RED WING, MINN., U. S. A.**



## The Indians Paddled

But that's no reason *you* should. You'll have to do a lot of it with some motors we've seen.

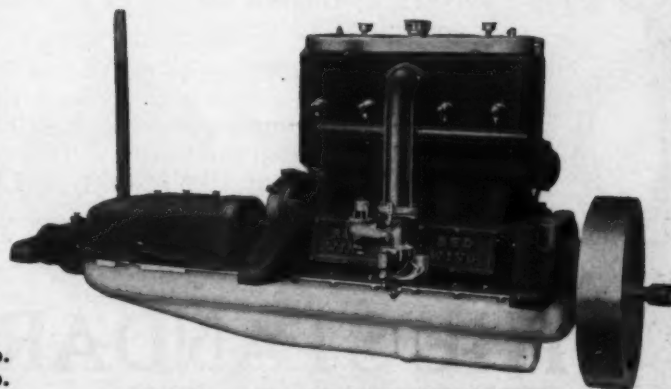
After the Indian paddle came the steam "wheeler" with one man shoveling coal. Then the Naptha Launch that needed an engineer with the arms of an



Unit Power Plant Models "A" and "AA" THOROBRED  
14-20 H.P., 3 1/2 x 4 1/2"; 18-24 H.P., 3 3/4 x 4 3/4"  
Furnished with or without Unit Power Plant

a man to appreciate a REAL engine when he gets his hands on it.

After all these experiments came the four-cycle, the modern motor of today—the motor that has come to stay. And of these we say without egotism that the Red Wing Thorobred is the fin-



Unit Power Plant Model "H" THOROBRED  
25-33 H.P., 3 3/4 x 5 1/4"  
Furnished with or without Unit Power Plant

## Build A "Flying Eagle" Yourself



The Fastest Boat for its size and power in the world, making 22 miles per hour

**T**HE Model 2-0 EAGLE High Speed Engine was selected for this boat by the designer and builder, after making tests with several other engines of similar dimensions. A speed of 22 miles per hour for a 16 ft. hydroplane, with a  $4\frac{1}{2}$ " x 4" Engine, turning a 14 x 22 x 3 Hyde Propeller 1300 R.P.M., is truly wonderful, and is conclusive evidence of the extremely high efficiency of the power plant.

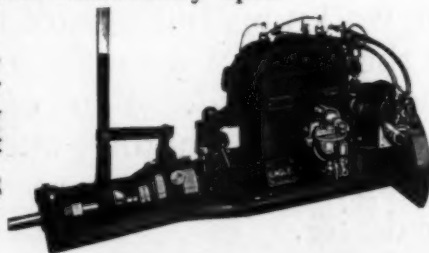
The combination of the Model 2-0 EAGLE Engine, and Mr. Apel's boat is one hard to beat with boats of other designs having double the power. This fact has been recognized by all who are familiar with the performances of the boats built from this design and powered with EAGLE Engines.

### HERE IS THE CHANCE YOU HAVE BEEN WAITING FOR.

You can now buy complete working plans of the FLYING EAGLE from Mr. Adolph E. Apel, Ventnor Heights, Atlantic City, N. J., who will gladly furnish further particulars and prices on application.

The Model 2-0 EAGLE Engine, to which the FLYING EAGLE owes half its success, is illustrated and fully described in our big catalog, which we will send for the asking. Our large stock of Engines enables us to make deliveries immediately upon receipt of all orders.

Now is the time to get started if you expect to build a boat in your spare time after regular working hours so that it will be ready for launching in the Spring. If you haven't ordered a set of FLYING EAGLE plans, and a Model 2-0 EAGLE Engine, DO IT NOW.



## THE STANDARD CO., TORRINGTON, CONNECTICUT

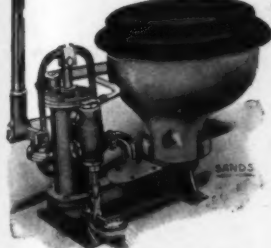


# "SANDS" MARINE SANITARY FIXTURES

AN ASSORTMENT  
AND SPECIALTIES  
POINTMENTS  
—GUARANTEED

OF THE FINEST MARINE PLUM  
EVER MADE. THEIR QUALITY,  
AND CONSTRUCTION ARE THE BEST  
WITHOUT RESERVE. IMMEDIATE  
FROM STOCK.

BING FIXTURES  
SERVICE, AP-  
IN THE WORLD  
SHIPMENT



The "Frisco"—Plate S-2046

(Design Patented—Copyrighted)  
The "Frisco" PUMP WATER  
CLOSET, extra heavy Vitro-Adamant  
Oval Hopper Bowl. 3" supply and  
waste pump.  
Plate S-2045 Polished oak seat, \$59.00  
Plate S-2046 Polished oak seat, 60.00

Dimensions: Width 24", front to  
back 21", height 17 1/2". Weight: Net  
80 lbs. Shipping 150 lbs.



"Iowa," Plate S-2040

(Patented—Copyrighted)  
The "Iowa" Pump Water Closet has  
latest style Vitro-Adamant extra heavy  
oval flushing rim, straight back hopper  
bowl, fitted with 4" supply and waste  
pump.  
Price with quartered oak, cabinet finish  
seat and cover, pump rough with  
polished trimmings.... \$85.00

Plate S-127

The "Grandeur"  
Round Way  
Sea Cook. For  
large closets.  
1/4 inch \$3.25  
1 1/2 " 4.00  
1 1/2 " 5.50  
2 " 7.00  
2 1/2 " 11.00  
3 1/2 " 18.00  
Strainer for sup-  
ply 25c extra.



"Florida" Plate S-2015

(Patented—Copyrighted)  
The "Florida" Pump Water Closet has  
new style extra heavy oval pedestal Vitro-  
Adamant bowl, improved supply and waste  
pump having 4" cylinder.  
Complete with Oak seat and cover. Pump  
rough with polished trim-  
mings ..... \$100.00



"National" Plate S-2010

(Patented—Copyrighted)  
The "National" Pump Water Closet has  
extra heavy Vitro-Adamant Oval Flushing  
rim Pedestal bowl fitted with 8" combined  
supply and waste pump.  
Complete with Oak seat and cover.  
Pump rough with polished  
trimmings ..... \$132.50



The "Bow" Closet, Plate S-2050

(Design Patent Applied For)  
The "Bow" Closet, Vitro-Adamant  
bowl, 2 1/2" pump, located at rear,  
fitted with swing handle. Quick  
opening supply valve. Space oc-  
cupied, 15x24".  
Pump rough, with finished trim-  
mings, oak seat, N. P. \$30.00  
hinges  
Dimensions: Front to back 23 in.,  
width 14 in., height 12 in.  
Net weight, 35 lbs. Shipping, 70  
lbs.



Plate S-186

The "Aero" Folding Lavatory, N. P.  
copper basin and slab, N. P. compo-  
sition single-acting pump, N. P. copper  
lining; oak woodwork..... \$28.00  
Mahogany finish..... 27.50  
Height over all, 19 1/2 in.; width, 15  
in.; depth closed, 5 1/2 in.; depth open,  
16 1/2 in.; basin, 10 in.

Plate S-187

"Aero" Folding Lavatory; same as  
Plate S-186, except with faucet.  
Oak Woodwork ..... \$22.50  
Mahogany Finish ..... 25.00

"Knockabout"—

Plate S-34

(Patented—Copyrighted)  
The "Knockabout" Improved Pump  
Water Closet, Vitro-Adamant round  
flushing rim bowl, 2 1/2" combined sup-  
ply and waste pump. "Bands" patent  
automatic safety supply foot valve, and  
"Bands" patent back-water check valve.  
Pump rough, finished trim-  
mings, oak seat and cover.  
Mahogany seat and cover.  
add  
Weight: Net, 45 lbs.; gross, 75 lbs.  
Dimensions: Front to  
width, 17 1/4"; height, 14".



Plate S-150

The "Glenwood" Folding Lavatory, with  
Vitro-Adamant oval basin, N. P. copper  
lining, N. P. brass double-acting pump.  
N. P. brass trimmings.  
Quartered oak, polished finish..... \$42.50  
Mahogany, polished finish..... 44.00

Plate S-152

"Croton" Folding Lavatory, same as  
Plate S-150, except with faucet for pres-  
sure or gravity supply.  
Quartered oak, polished finish..... \$37.50  
Mahogany, polished finish..... 39.00



"Winner"—Plate S-2061

(Patented—Copyrighted)  
The "Winner" Pump Water Closet,  
Vitro-Adamant Round Hopper Bowl,  
oak seat, N. P. brass pump, 2 1/2"  
supply and waste pump. "Bands" pa-  
tent quick opening supply valve. All  
metal parts brass and composition.  
Plate S-2060 Fixture as  
described with oak seat.  
Plate S-2061 Fixture as  
shown with oak seat and  
cover.  
Dimensions: 20" front to back, 25"  
wide, 15" high. Weight: 56 lbs. Net,  
68 lbs., Shipping.



Plate S-3380

Small Vitro-Adamant 12"  
Flat Back Lavatory, with Nickel  
Plated Flange and  
Stopper. Chain  
and Stay. Nickel  
Plated Faucet.  
Trap, Standing  
Soap Dish, N. P.  
730 Supply  
Pump. Complete as de-  
scribed. \$18.95



Plate S-3183

The "Manatee" 14" Vitro-Ada-  
mant Flat Back Lavatory, with  
N. P. Basin Pump and waste  
fittings; no trap ..... \$22.75

Plate S-3180

The "Manatee" Lavatory, same  
as Plate S-3183, except with  
faucet, instead of pump and with  
N. P. Full "G" Trap..... \$13.35



Plate S-773

Rough Brass Re-  
versible Pump  
for Gasoline or  
Oil. Special  
pipes to deck. White enamel  
bulkhead brackets.  
Price ..... \$10.50



Plate S-208-B

The "Madison" Vitro-Adamant  
Lavatory in one piece, N. P. dou-  
ble acting brass pump, N. P.  
brass full "G" trap, with waste  
bulkhead brackets.  
Price ..... \$35.50

Plate S-207B

The "Majestic" Lavatory, same  
as above except square front. \$34.50



PLATE S-3191

The "Moss" 14" Vitro-  
Adamant Corner Lavatory  
with N. P. Brass Pump and  
waste fittings and N. P. Full  
"G" Trap ..... \$36.00

PLATE S-3197

The "Moss" Lavatory;  
same as Plate S-3191, ex-  
cept with faucet instead of  
pump and without trap. \$10.75



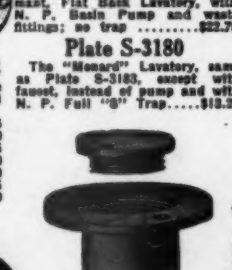
Plate S-3381

Small Vitro-Adamant  
Corner Lavatory only 12"  
on side with Nickel-Plated  
Plug. Stopper chain and  
stay. Nickel-Plated Fac-  
et. Trap, Standing Soap  
Dish, N. P. 727 Supply  
Pump. Complete as de-  
scribed ..... \$26.50



Plate 1301-B

Cast Bronze  
Round Raised  
Strainer.  
2 1/2 " ..... \$0.35  
3 " ..... .50  
4 " ..... .65  
5 " ..... 1.00  
6 " ..... 1.80  
8 " ..... 2.25  
10 " ..... 3.00



POLISHED BRASS  
DECK PLATES,  
HEAVY WEIGHT  
GUARANTEED

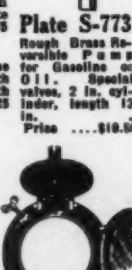


Plate S-1003

Port Light with Stern  
Shutter.  
Plate Brass  
6" ..... \$5.45  
7" ..... 6.40  
8" ..... 7.40  
9" ..... 8.40  
10" ..... 9.40  
11" ..... 10.40  
12" ..... 11.40  
14" ..... 13.40  
16" ..... 15.40  
18" ..... 17.40  
20" ..... 19.40  
22" ..... 21.40  
24" ..... 23.40  
26" ..... 25.40  
28" ..... 27.40  
30" ..... 29.40  
32" ..... 31.40  
34" ..... 33.40  
36" ..... 35.40  
38" ..... 37.40  
40" ..... 39.40  
42" ..... 41.40  
44" ..... 43.40  
46" ..... 45.40  
48" ..... 47.40  
50" ..... 49.40  
52" ..... 51.40  
54" ..... 53.40  
56" ..... 55.40  
58" ..... 57.40  
60" ..... 59.40  
62" ..... 61.40  
64" ..... 63.40  
66" ..... 65.40  
68" ..... 67.40  
70" ..... 69.40  
72" ..... 71.40  
74" ..... 73.40  
76" ..... 75.40  
78" ..... 77.40  
80" ..... 79.40  
82" ..... 81.40  
84" ..... 83.40  
86" ..... 85.40  
88" ..... 87.40  
90" ..... 89.40  
92" ..... 91.40  
94" ..... 93.40  
96" ..... 95.40  
98" ..... 97.40  
100" ..... 99.40



Plate S-750

Double Acting Brass  
Auto Bilge Pump, 15  
inches long under spout  
and fitted with 5 feet of  
rubber hose.  
No. 1—1 1/2" diam.. \$3.00  
No. 2—1 1/4" diam.. 4.50  
No. 3—1 1/2" diam.. 5.50  
No. 4—1 1/4" diam.. 6.50  
No. 5—1 1/2" diam.. 7.50  
No. 6—1 1/4" diam.. 8.50  
No. 7—1 1/2" diam.. 9.50  
No. 8—1 1/4" diam.. 10.50  
No. 9—1 1/2" diam.. 11.50  
No. 10—1 1/4" diam.. 12.50  
No. 11—1 1/2" diam.. 13.50  
No. 12—1 1/4" diam.. 14.50  
No. 13—1 1/2" diam.. 15.50  
No. 14—1 1/4" diam.. 16.50  
No. 15—1 1/2" diam.. 17.50  
No. 16—1 1/4" diam.. 18.50  
No. 17—1 1/2" diam.. 19.50  
No. 18—1 1/4" diam.. 20.50  
No. 19—1 1/2" diam.. 21.50  
No. 20—1 1/4" diam.. 22.50  
No. 21—1 1/2" diam.. 23.50  
No. 22—1 1/4" diam.. 24.50  
No. 23—1 1/2" diam.. 25.50  
No. 24—1 1/4" diam.. 26.50  
No. 25—1 1/2" diam.. 27.50  
No. 26—1 1/4" diam.. 28.50  
No. 27—1 1/2" diam.. 29.50  
No. 28—1 1/4" diam.. 30.50  
No. 29—1 1/2" diam.. 31.50  
No. 30—1 1/4" diam.. 32.50  
No. 31—1 1/2" diam.. 33.50  
No. 32—1 1/4" diam.. 34.50  
No. 33—1 1/2" diam.. 35.50  
No. 34—1 1/4" diam.. 36.50  
No. 35—1 1/2" diam.. 37.50  
No. 36—1 1/4" diam.. 38.50  
No. 37—1 1/2" diam.. 39.50  
No. 38—1 1/4" diam.. 40.50  
No. 39—1 1/2" diam.. 41.50  
No. 40—1 1/4" diam.. 42.50  
No. 41—1 1/2" diam.. 43.50  
No. 42—1 1/4" diam.. 44.50  
No. 43—1 1/2" diam.. 45.50  
No. 44—1 1/4" diam.. 46.50  
No. 45—1 1/2" diam.. 47.50  
No. 46—1 1/4" diam.. 48.50  
No. 47—1 1/2" diam.. 49.50  
No. 48—1 1/4" diam.. 50.50  
No. 49—1 1/2" diam.. 51.50  
No. 50—1 1/4" diam.. 52.50  
No. 51—1 1/2" diam.. 53.50  
No. 52—1 1/4" diam.. 54.50  
No. 53—1 1/2" diam.. 55.50  
No. 54—1 1/4" diam.. 56.50  
No. 55—1 1/2" diam.. 57.50  
No. 56—1 1/4" diam.. 58.50  
No. 57—1 1/2" diam.. 59.50  
No. 58—1 1/4" diam.. 60.50  
No. 59—1 1/2" diam.. 61.50  
No. 60—1 1/4" diam.. 62.50  
No. 61—1 1/2" diam.. 63.50  
No. 62—1 1/4" diam.. 64.50  
No. 63—1 1/2" diam.. 65.50  
No. 64—1 1/4" diam.. 66.50  
No. 65—1 1/2" diam.. 67.50  
No. 66—1 1/4" diam.. 68.50  
No. 67—1 1/2" diam.. 69.50  
No. 68—1 1/4" diam.. 70.50  
No. 69—1 1/2" diam.. 71.50  
No. 70—1 1/4" diam.. 72.50  
No. 71—1 1/2" diam.. 73.50  
No. 72—1 1/4" diam.. 74.50  
No. 73—1 1/2" diam.. 75.50  
No. 74—1 1/4" diam.. 76.50  
No. 75—1 1/2" diam.. 77.50  
No. 76—1 1/4" diam.. 78.50  
No. 77—1 1/2" diam.. 79.50  
No. 78—1 1/4" diam.. 80.50  
No. 79—1 1/2" diam.. 81.50  
No. 80—1 1/4" diam.. 82.50  
No. 81—1 1/2" diam.. 83.50  
No. 82—1 1/4" diam.. 84.50  
No. 83—1 1/2" diam.. 85.50  
No. 84—1 1/4" diam.. 86.50  
No. 85—1 1/2" diam.. 87.50  
No. 86—1 1/4" diam.. 88.50  
No. 87—1 1/2" diam.. 89.50  
No. 88—1 1/4" diam.. 90.50  
No. 89—1 1/2" diam.. 91.50  
No. 90—1 1/4" diam.. 92.50  
No. 91—1 1/2" diam.. 93.50  
No. 92—1 1/4" diam.. 94.50  
No. 93—1 1/2" diam.. 95.50  
No. 94—1 1/4" diam.. 96.50  
No. 95—1 1/2" diam.. 97.50  
No. 96—1 1/4" diam.. 98.50  
No. 97—1 1/2" diam.. 99.50  
No. 98—1 1/4" diam.. 100.50  
No. 99—1 1/2" diam.. 101.50  
No. 100—1 1/4" diam.. 102.50



Plate S-771

Brass Gasoline  
and Oil Pump  
with special  
valves.  
Dia. Ls.  
1 1/2 " 15 \$3.00  
1 1/4 " 18 7.50  
1 1/2 " 24 13.50



Plate S-750-A

New Style Double-Act-  
ing Brass Bilge Pump,  
with foot attachment and  
5-ft. discharge and cus-  
tom hose with brass  
strainer.  
No. 1—1 1/2" diam., 15"  
long ..... \$5.00  
No. 2—1 1/4" diam., 18"  
long ..... \$6.00  
No. 3—1 1/2" diam., 21"  
long ..... \$7.00  
No. 4—1 1/4" diam., 24"  
long ..... \$8.00  
No. 5—1 1/2" diam., 27"  
long ..... \$9.00  
No. 6—1 1/4" diam., 30"  
long ..... \$10.00  
No. 7—1 1/2" diam., 33"  
long ..... \$11.00  
No. 8—1 1/4" diam., 36"  
long ..... \$12.00  
No. 9—1 1/2" diam., 39"  
long ..... \$13.00  
No. 10—1 1/4" diam., 42"  
long ..... \$14.00  
No. 11—1 1/2" diam., 45"  
long ..... \$15.00  
No. 12—1 1/4" diam., 48"  
long ..... \$16.00  
No. 13—1 1/2" diam., 51"  
long ..... \$17.00  
No. 14—1 1/4" diam., 54"  
long ..... \$18.00  
No. 15—1 1/2" diam., 57"  
long ..... \$19.00  
No. 16—1 1/4" diam., 60"  
long ..... \$20.00  
No. 17—1 1/2" diam., 63"  
long ..... \$21.00  
No. 18—1 1/4" diam., 66"  
long ..... \$22.00  
No. 19—1 1/2" diam., 69"  
long ..... \$23.00  
No. 20—1 1/4" diam., 72"  
long ..... \$24.00  
No. 21—1 1/2" diam., 75"  
long ..... \$25.00  
No. 22—1 1/4" diam., 78"  
long ..... \$26.00  
No. 23—1 1/2" diam., 81"  
long ..... \$27.00  
No. 24—1 1/4" diam., 84"  
long ..... \$28.00  
No. 25—1 1/2" diam., 87"  
long ..... \$29.00  
No. 26—1 1/4" diam., 90"  
long ..... \$30.00  
No. 27—1 1/2" diam., 93"  
long ..... \$31.00  
No. 28—1 1/4" diam., 96"  
long ..... \$32.00  
No. 29—1 1/2" diam., 99"  
long ..... \$33.00  
No. 30—1 1/4" diam., 102"  
long ..... \$34.00

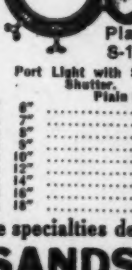
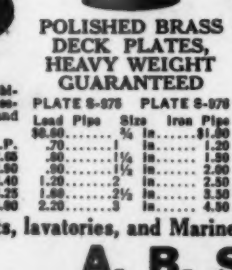


Plate S-4300

Cast Bronze Combi-  
nation Inlet Con-  
nection with Strainer  
and Scoop.  
As described, \$4.50

Plate S-4301

Same as above,  
but also fitted  
with adjustable  
foot rest..... \$5.00



Complete line of closets, lavatories, and Marine specialties described in NEW Catalogue "R" ready in near future, sent free on request.

## A. B. SANDS & SON COMPANY

Largest Manufacturers in the World

MARINE PLUMBING SPECIALISTS

22-24 Vesey St., New York, U. S. A.

1849—"SIXTY-SEVEN YEARS OF QUALITY"—1916

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.

# WINTON

The purchaser of an engine must of necessity take much for granted. He cannot have intimate knowledge of the degree of excellence represented in the engine he buys.

As a rule therefore, entire dependence is placed in the engine builder to make his product measure up to the standard expected of it.

## Modernism

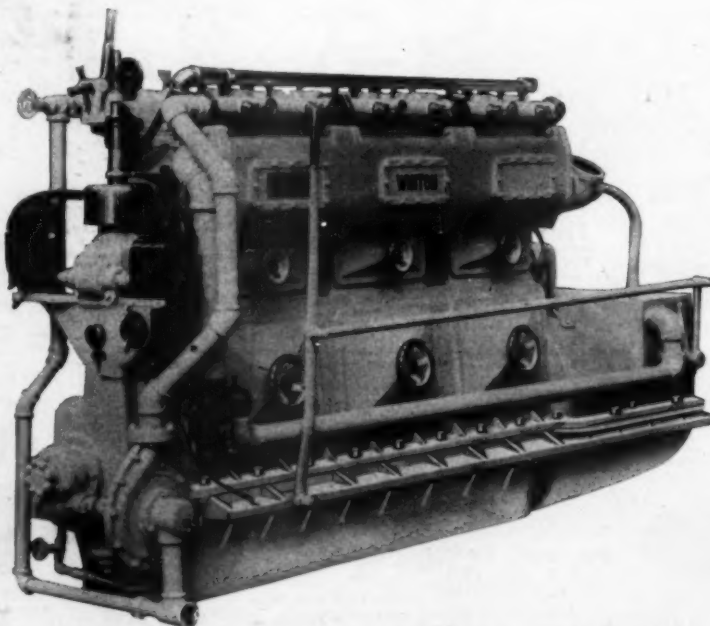
The manufacturer whose design is antiquated, whose methods are obsolete, cannot do this. However good such an engine may have been in the past, it is not to be classed with the machine of modern design and construction.

Winton engines are modern. In their design precedent was followed only so far as was compatible with progressive ideas. In construction, special tools have injected a new element of quality.

That the high quality of Winton engines will be upheld in every particular is the purchaser's protection and our guarantee.

*For complete information  
address*

**Winton  
Engine Works  
Cleveland, Ohio**





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# Look up the



# at the Show

## It's Worth Examining—

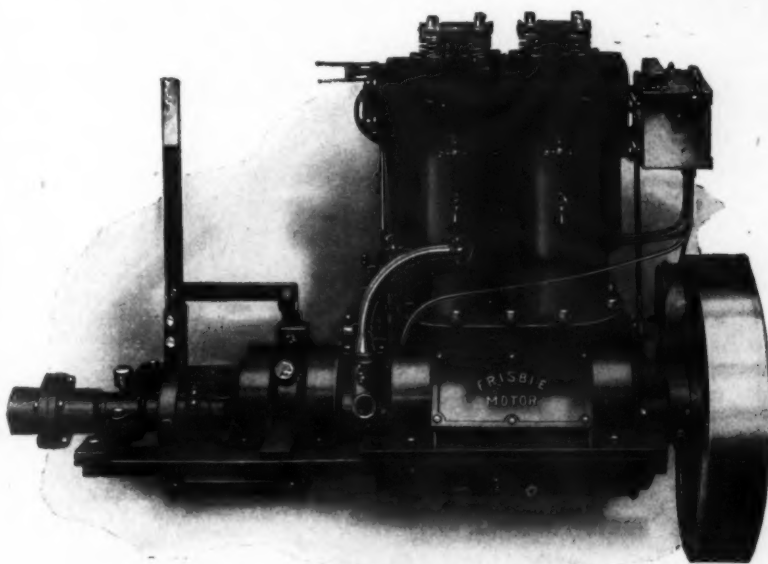
Make it a point to look up the Frisbie Motor exhibit while you are visiting the New York Motor Boat Show—not only because *we* want you to—but because you will find it something worth seeing.

Handsomely finished boats and beautifully polished motors are good to look at, but the Frisbie offers something more than this for the man who knows motor construction from the inside. It shows the highest development of the famous valve-in-head type of design, which all experts concede to be 15 to 20% more efficient than any other engine design.

You have heard a lot of general talk about the superiority of valve-in-head motors. Come and let us show you how and why they are so much more efficient—let us prove that the gain in efficiency is *actual* as well as theoretical.



Frisbie Valve-in-Head Motors are made in a complete range of sizes, from 3 H.P. to 75 H.P. One, two, three, four and six cylinder models. Suitable for all types of boats, business or pleasure, requiring power plants within the above limits.



If you don't visit the show write us for full information about Frisbie Valve-in-Head Design. You will find the Frisbie catalog unusually interesting.

**DEALERS:** If you are looking for a motor that is better than the general run, let us talk with you about the Frisbie. See us at the Show.

## THE FRISBIE MOTOR CO., Inc., MIDDLETOWN, CONN.

Export Department, 95 William Street, New York



When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.

# Fastest Boat in the World



**\$45**

17-Footer

Buys this complete knock-down boat (open cockpit) selected oak frame, clear cypress planking, decking and interior finish. Cut to shape and fitted, including hardware (everything except paint).



**\$95**

17-Footer

Buys this finished boat, painted and varnished, polished brass fittings, fully equipped. Ready for the water (excepting motor and auto top). Catalog quotes prices with various motors installed.

*10 to 32 Miles with 4 to 25 H. P.*

**W**ITH from 4 to 10 horse-power the 17-footer is a comfortable family launch, semi-V-bottom design, roomy, staunch and seaworthy. With 12 or more horsepower the boat becomes in effect a stepless hydroplane, which is the fastest model yet developed. The speed is limited only by the power and weight of motor used.

When motor is purchased with the finished boat it is installed and connected up ready to run.

Send for our catalogue giving full particulars.

# Lowest-Priced Boat in the World

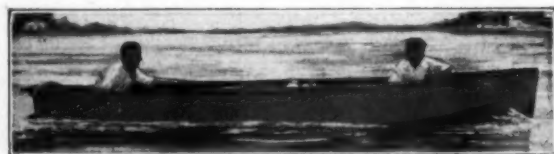
*For Inboard or Outboard Motor*



**\$25**

15-Footer

Buys this complete knock-down boat, oak frame, clear cypress planking, cut to shape and fitted. All hardware included. Finished boat painted and varnished, ready for the water, \$45.



**\$89**

15-Footer

Buys this finished boat, painted and varnished, fully equipped, as shown above, with outboard motor or 2 horsepower inboard motor installed.

**T**HESE 15-footers are also of the semi-V-bottom type. The model is designed especially for outboard motor, eliminating the defects of the ordinary row-boat. It has an extra strong reinforced stern.

With a light inboard motor installed it makes a "natty" and serviceable run-about. Just the thing for resorts and liveries. The prices quoted with either motor represent the greatest motor boat value ever offered.

Without motor it makes a first class, all-around rowboat, light and roomy. Full particulars on request.

Our *Big Free Catalogue* shows cruisers, launches, sailboats rowboats and canoes. Over 100 designs. A postal brings it,

**Brooks Mfg. Co., 6302 Rust Ave., Saginaw, Mich.**



# Build Your Own Boat

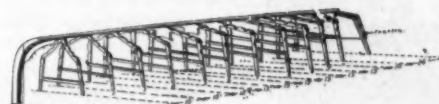
## The Home Workshop

**T**HOUSANDS of fathers and mothers recognize the clean, healthy educational value of the home workshop. Swinging a hammer is just as good exercise as pulling a chest weight and there's profit and pleasure in the hammer movement. Any room of sufficient size will serve as a workshop, and the building of a single boat will demonstrate the value of the venture. *Any 14 year-old boy can build these boats.*

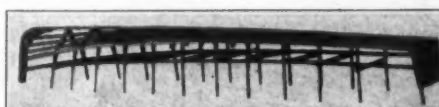
The knock-down materials, which we furnish, are in effect the raw materials required. We do all the difficult part of the work and send full illustrated instructions to assemble the shaped parts which we furnish. You don't need to know anything about boats or carpentry. The tools required are common to every household. Catalogue gives full particulars.



As you receive it. Keel marked and bored for the ribs shown below.



About one hour later. Each rib comes notched, shaped and fastened together with cross-tie.



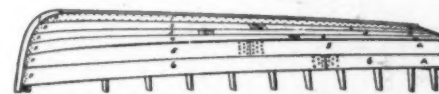
About two hours later. The stringers or battens are laid and fastened in the mortises which are provided.

## Builder-Agents Wanted

### A Business Opportunity.

**T**HIS is a rare chance to engage in a pleasant and profitable business. By turning our knock-down materials into finished boats, the value is more than quadrupled. Practically no investment is necessary. About two-thirds of the value of a well-finished boat is in the labor and builder's profit. Besides, a local builder overcomes high freight rates that must be added to the cost of the finished boat shipped from distant factories.

If you are making less than \$10 per day, give this business opening a trial, test it during spare time. There's hundreds of localities that will keep you and many employees busy. Estimate how many dozens or hundreds of these low-priced, popular, speedy, best all around boats ever produced, can be sold in your vicinity. Send for our **Big Free Catalogue**.



About two days later. The planks come cut to shape, each marked for its location. Nothing difficult but lots of nailing.



Now ready for interior finish and painting.



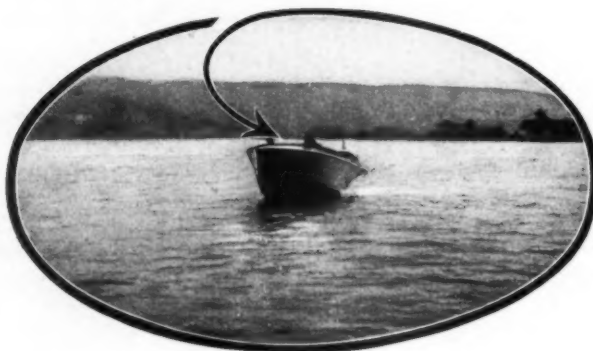
These few illustrations are greatly reduced in size. Our regular instructions completely cover every detail.

**Brooks Mfg. Co., 6302 Rust Ave., Saginaw, Mich.**

# THE JOHNSON MARINE REVERSE GEAR

## INSTALLED IN THE E. J. M.

### Results



Read and  
Be  
Convinced

The Above  
Speed Boat is a  
19-Ft. Hacker  
Hydroplane  
equipped with  
a 24-29-H.P.  
Aluminum  
Smalley Motor  
and a No. 2  
Carlyle  
Johnson  
Marine  
Reverse Gear.

Best Speed,  
26 $\frac{3}{4}$  miles  
per hour.

E. J. Mallon  
TICONDEROGA N. Y.

Oct. 4, 1915.

Carlyle Johnson Mch. Co.  
Manchester, Conn.

Gentlemen:-

In this; the day of knocks; a boost will not come amiss. You will probably wonder what this is all about. Well this is what it is about: two years ago I purchased a No. 2 gear from you through the Ticonderoga Machine Works of this place, and this season I have run my hydro (E.J.M.) over 5,000 miles without one seconds gear trouble and mind you that over 3,000 miles of this has been at high-speed (20 to 24 mi. per hour). I have won two cups and three medals; that is, three firsts and one third out of four starts.

I take great pleasure in congratulating you upon the continuous, good performance your gear under any and all circumstances, and I certainly have put it to some severe tests, one in particular; twelve hours straight at 20 miles per hour and never so much as warmed it. I also give my gear a great deal of the credit in winning the races this season. I think I have an outfit whose reliability is hard to beat. The "Smalley Motor" and the "Johnson Gear".

Thanking you and wishing you every success in the future, I am

Very truly yours,

*E. J. Mallon*

P. S. Enclosed find photo of the E. J. M. taken at about 25 miles per hour.

The Reverse  
Gear in the  
above boat had  
run over 4,500  
miles this  
season before  
participating in  
the races  
listed below.

#### RACES WON DURING THE SEASON OF 1915 BY THE ABOVE BOAT

First Place: August 26th. Island Harbor Cup Race.  
First Place: September 6th. Wooden Cup Race.

First Place: September 6th. Marion Cup Race.  
Third Place: September 6th. Iroquois Medal Race.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.*



# THE JOHNSON MARINE REVERSE GEAR

## Embodies the A.B.C. of High Grade Reverse Gear Construction

A for ALLOY STEEL: 3½% Nickel Steel, used in all GEARS and SHAFTING properly hardened and heat treated.

B for BALL BEARINGS: DOUBLE ROW BALL BEARINGS of an approved type on the main drive shafts in each end of the case, the propeller end being a DOUBLE THRUST BEARING.

C for CLUTCHES:

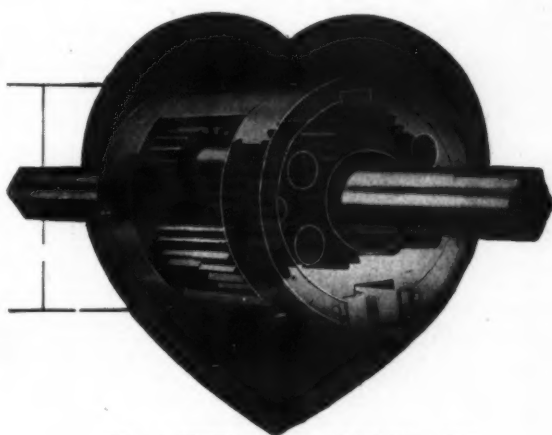
## THE JOHNSON FRICTION CLUTCH

in a DOUBLE TYPE is THE HEART of THE JOHNSON ALLOY STEEL REVERSE GEAR. Investigate these features, new to REVERSE GEAR construction, which we have successfully applied and used, and then use your own judgment in selecting the Gear for your own boat for the coming season.

This is the interior of the Alloy Steel Gear that you have seen Advertised in Motor Boating the past six months.



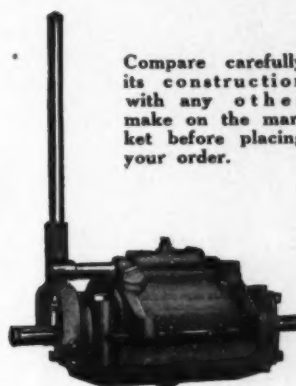
Showing construction



No. 1 SIZE

MODEL "F"

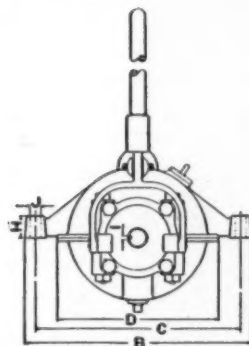
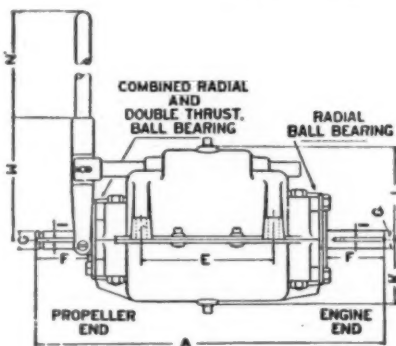
Compare carefully its construction with any other make on the market before placing your order.



Exterior



Write for Catalog



Write for Catalog

Gear No.	H.P. Per 100 R.P.M. Max.	H.P. for High Speed Motors Max.	H.P. for Medium Speed Motors Max.	WEIGHT		List Price for Cast Iron Case	List Price for Aluminum Case	DIMENSIONS IN INCHES															
				Cast Iron Case	Aluminum Case			A	B	C	D	E	F	G	H	I	J	K	L	M	N		
0	1/2	5	3	23	19	\$24.00	\$36.00	12 3/4	7 3/4	7	5 1/2	4 1/2	2	5/8	3/4	1/2	1/2	2 1/4	3 1/4	4 1/4	7 1/4		
1	1	10	5	40	32	36.00	48.00	15 1/2	9 3/4	8 3/4	6 1/2	4 1/2	2 1/2	3/4	1	1/2	1/2	3 1/4	4 1/4	5 1/4	13 1/2		
*1 "A"	1 1/2	20	10	70	55	42.00	54.00	19 1/2	10 3/4	9	7 1/2	6 1/2	3 1/2	1	1 1/4	1 1/4	1 1/4	3 1/4	4 1/4	5 1/4	15 1/2		
2	3	30	15	83	75	48.00	60.00	21 1/2	11 3/4	9 3/4	8 3/4	6 1/2	4 1/4	1 1/4	1 1/4	1 1/4	1 1/4	3 1/4	4 1/4	5 1/4	15 1/2		
*3	5	50	25	247	160	72.00	90.00	27 1/2	16 1/2	14 1/4	11 1/2	8 3/4	5 1/2	1 1/2	1 1/4	1 1/4	1 1/4	5 1/4	7 1/4	9 1/4	27 1/2		

\*Delivery date on request on these sizes.

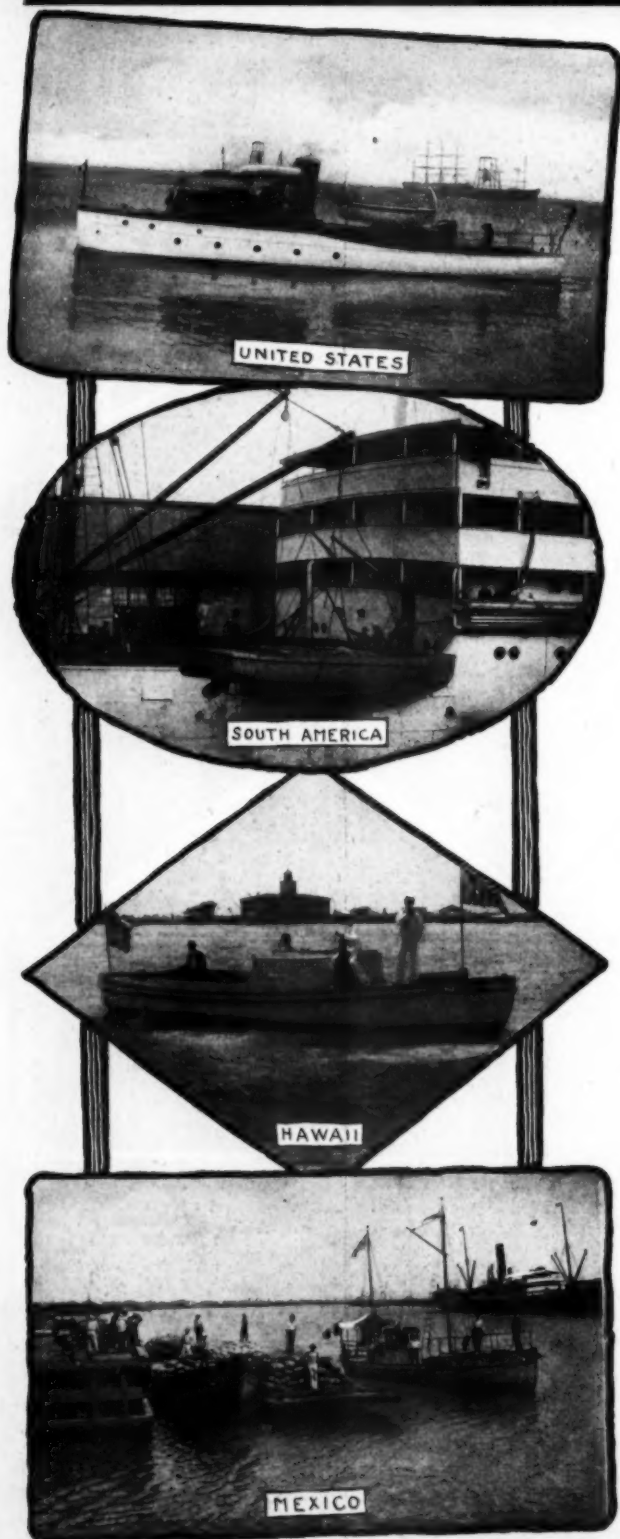
A Comprehensive Test just made of three of the five sizes of Gears listed above, by one of the large Marine Motor Manufacturers, gave the following results. For brevity sake we have only shown part of this test, but it will outline to you, Mr. Purchaser, that Johnson Gears are Manufactured with a factor of safety equal to double their rated capacity, and more. However, they are not guaranteed for more than their rated capacity above.

Gear No.	Clutch Carried Without Slipping	Clutch Slipped	Carried on Reverse		R.P.M.		H.P. Delivered	
	Forward	Forward	Without Failure	Failed	Motor	Dyn.	At Actual Speed	Per 100 R. P. M.
No. 0.....	65 lbs.	77.50 lbs.			895	895	11.10	1.24
No. 1.....	140 lbs.				890	885	13.00	1.47
No. 2.....	315 lbs.				880	880	23.5	2.67
					850	850	50.97	6.00

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

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# World's



## Standard Marine Engines

**W**ITHOUT any attempt at the spectacular, without extensive or extravagant advertising, STANDARD engines have progressed steadily in sale and popularity to their present enormous majority in this and every country of the globe.

The STANDARD Company has doubled and trebled its factory space in the last three years.

Still the factory has to continue to work both night and day shifts of men to make asked-for deliveries.

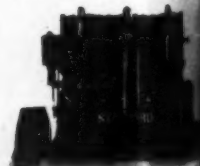
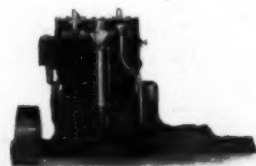
And prompt service is given to you.

Only the herculean efforts of the STANDARD Company to keep pace with the World's demand make this possible.

*Send for catalog and Prices.*

*BACK OF THE STAND*

**The Standard Motor**  
178 Whiton Street





# Standard

Are Used in Every Country

**R**ECORDS of the World's demand for marine engines prove that the STANDARD engine contains more inbuilt quality, service, economy and thorough satisfaction than any other engine built for heavy duty service.

The tremendous demand for the STANDARD alone proves it to most completely meet economic conditions in your boat. Amongst the thousands of STANDARD buyers are the keenest and closest buyers of the World, and with many price is a considerable factor.

The *driving power* in this developed quality product shows it to be the cheapest engine made upon the boats' *first trip*.

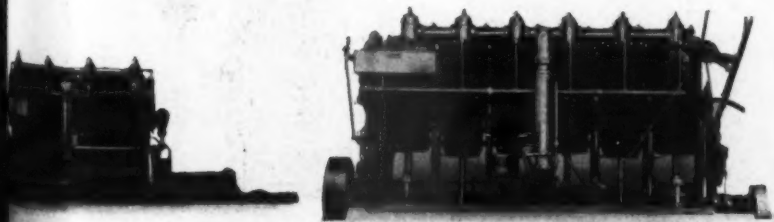
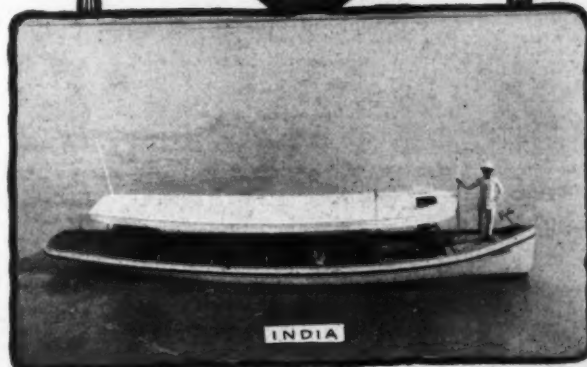
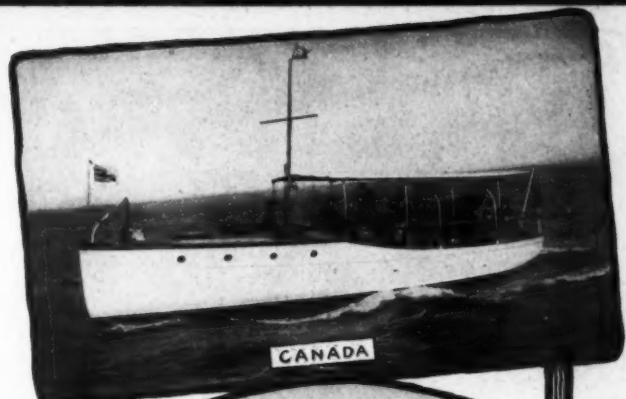
Every day you delay costs you dearly in satisfaction and money lost.

*Order Now.*

AND GUARANTEE IS

Construction Co.

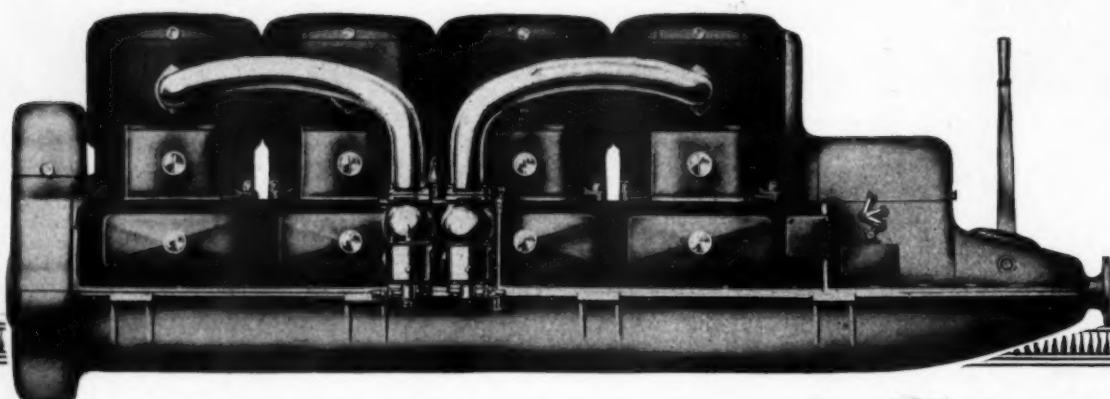
Jersey City, N. J.



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# An Engine for Connoisseurs

Model D-8  
Special.  
150-200  
H. P. With  
Starter and  
Generator.  
5½" x 7".  
Also built  
with 4 and  
6 Cylinders.



WITHOUT question the highest degree of excellence thus far achieved in marine motor construction is revealed in the new

## Mason Engines

These engines have been designed for motor connoisseurs,—for men who have used the finest engines of the past, and who are now looking for the progressive refinement which is logically expected in all things mechanical.

It has been attempted to produce in the *Mason* the best marine power plant that present engineering skill permits. That this ideal has been realized is acknowledged by all who have examined these engines.

The Mason is built by an organization of national reputation, which has produced fine machinery for nearly three-quarters of a century. It is backed by unlimited financial resources and within reasonable bounds is manufactured without regard for expense. The plant has facilities for manufacturing every part from the raw materials—casting, forging, machining, and finishing each detail without outside help.

Following automobile practice, more than a year has been devoted to the development of the motor. There has been no hurry to get it on the market. It is as completely tested as though it had been in general service for several years.

The illustrations show a motor absolutely clean-cut in every line. Not a moving part is exposed. There is no exterior piping.

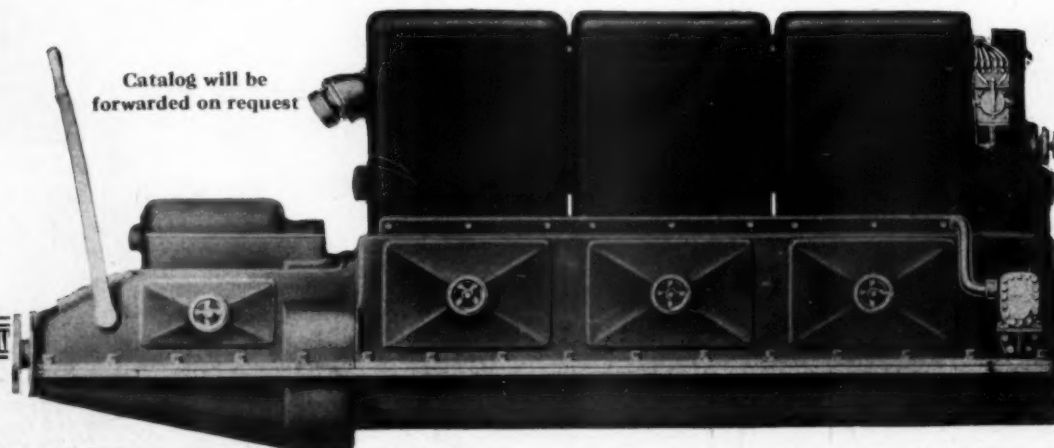
The interior of the motor is just as perfectly designed. All connections have gasket joints. Every working part is as accessible as in engines with exposed parts.

This is a silent engine, smooth running, compact, cleanly, and very powerful,—in fact, have shown one horsepower to every five cubic inches of piston displacement. It is as reliable as a steam engine. Every possibility of improvement has been exhausted for the present. When room for further refinement is discovered, the opportunity will be welcomed.

Type	Bore	Stroke	Cylinders	Horse Power
B4	4½"	6"	4	50-75
B Special	4½"	6"	4	25-40
D4	5½"	7"	4	40-60
D Special	5½"	7"	4	90-120
D6	5½"	7"	6	60-90
D6 Special	5½"	7"	6	120-160
D8 Special	5½"	7"	8	150-200
G4	6½"	9"	4	50-90
G6	6½"	9"	6	80-130

Mason Machine Works, Taunton, Mass.

Catalog will be  
forwarded on request



Model  
G-6 80-  
130 H.P.  
6½" x 9".  
Also  
Built  
with 4  
Cylinders.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.



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# COLUMBIAN



THE RIGHT WHEEL FOR ANY TYPE OF BOAT

## THE UNITED STATES GOVERNMENT

always specifies the amount of **blade surface** on every propeller ordered, proving that no one type of propeller will fit all types of boats.

**COLUMBIAN PROPELLERS** are the only ones that combine the right blade surface, diameter and pitch with greatest efficiency, accuracy as to pitch, balance, workmanship and material.

The superiority of

## COLUMBIAN MANGANESE BRONZE

is conclusively proven by the following recent tests:

	Test No. 0.	Test No. 1.	Test No. 9.	Test No. 21.
Breaking strength per square inch.....	76,000 lbs.	74,500 lbs.	69,900 lbs.	71,750 lbs.
Elastic Limit per square inch.....	38,000 lbs.	36,000 lbs.	35,500 lbs.	36,750 lbs.
(Pull required to start stretching.)				
Elongation in two inches.....	30%	26%	39%	37%
(Amount of stretch before breaking.)				

(Tests made by Dr. Chas. F. McKenna Laboratory, 50 Church St., N. Y. C.)

The United States Government requires:—Breaking Strength, 65,000 lbs.; Elastic Limit, 30,000 lbs.; Elongation, 20%.

**THAT IS WHY COLUMBIAN PROPELLERS ARE NOW USED BY THE UNITED STATES AND OTHER GOVERNMENTS, BY THE MOST UP-TO-DATE ENGINE MFRS. AND BY THE FASTEST BOATS THAT FLOAT.**

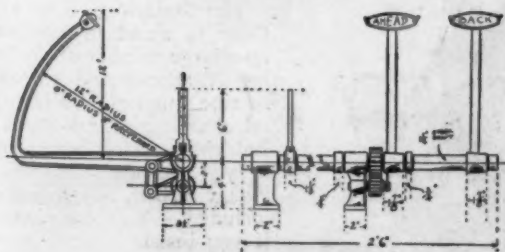
A most interesting propeller treatise, "Propellers in a Nut Shell," will be sent free upon request. Have you received your copy?

**COLUMBIAN BRASS FOUNDRY, 218 North Main Street  
FREEPORT, NEW YORK**

Call on us at the New York Motor Boat Show

New York Branch for Local City Sales only: Concourse, 50 Church St., New York City

**PEERLESS PROPELLERS** are made of Composition Bronze to meet the requirements of those using low-priced propellers. They are made from regular Columbian Patterns in "Arrow," "Rocket" and "Reliance" styles, and offer the best value on the market for the price. Castings are guaranteed sound. Ask for Peerless Price List.



Foot Reverse Control

### COLUMBIAN FOOT REVERSE CONTROL.

Operate your reverse gear with your foot.

### COLUMBIAN UNIVERSAL STRUTS ARE THE BEST

at prices no higher.

### RUDDERS OF ALL TYPES.

50 different patterns.

We have something special for your boat.



UNIVERSAL  
STRUT.  
SELF ALIGNING.

## When Emergency Calls

—Then is the time when every motor boat owner appreciates the value of a quick-working, dependable reverse gear.

While motor boating is really a very safe, delightful sport, yet unexpected difficulties are liable to occur at any time. You may be caught in a bad storm or a dense fog some day—you may be in danger of colliding with another boat—you might get into a perilous situation while traveling in crowded waters—you may have to make a treacherous landing—and you can never tell when your very life may depend upon instantaneous action.

Then—when emergency calls—you will be thankful if your power plant is equipped with a

### **Baldrige** Reverse Gear

Baldrige users say that they can motor anywhere with a feeling of confidence that in a critical situation their reverse gear is the one part of their equipment least likely to fail.

Years of actual service on thousands of motors have fully demonstrated Baldrige efficiency.

The one big outstanding feature of this reverse gear which immediately impresses experienced boat owners is the fact that it has but *one* mainshaft.

This extends through from bearing to bearing—it cannot possibly sag, and perfect alignment is permanently assured.

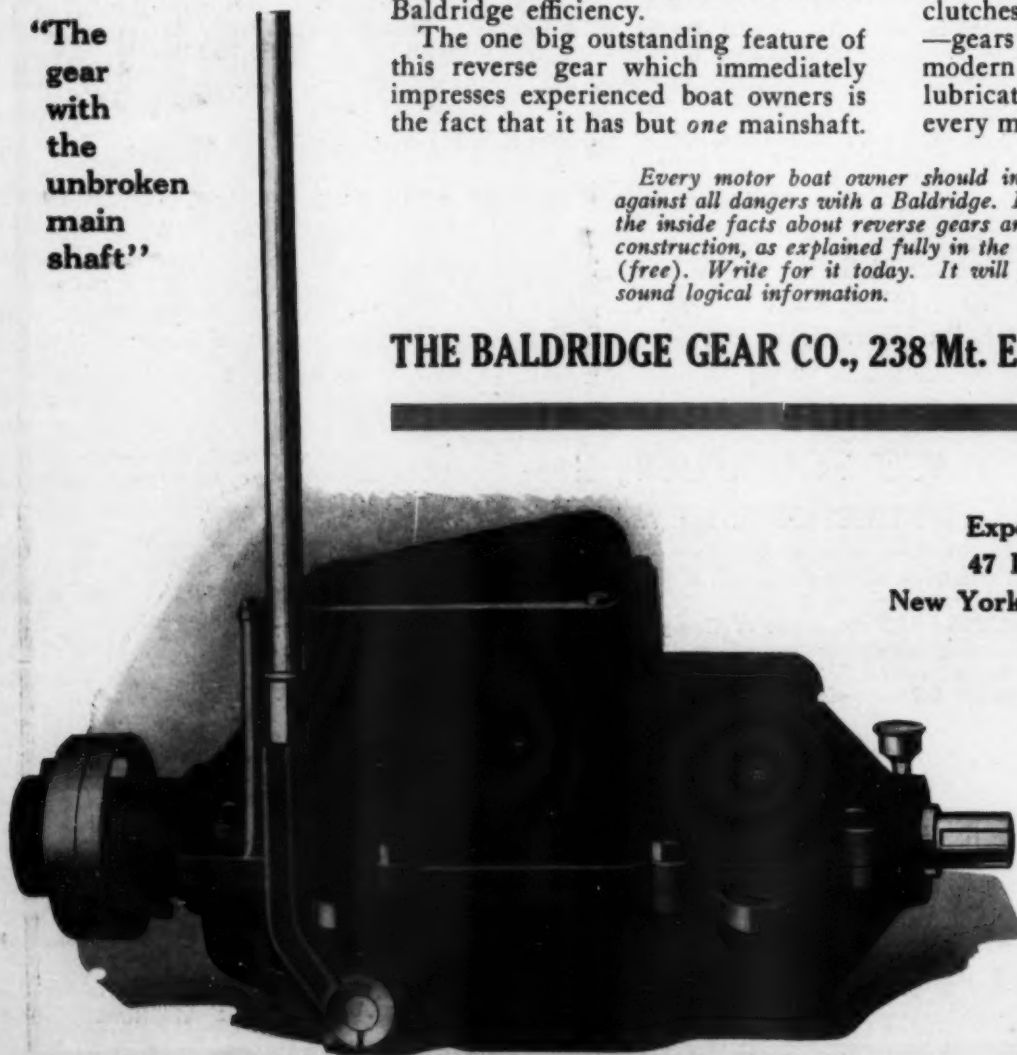
The Baldrige gear has more than double the support usually found in reverse gears—it has double expansion clutches with reinforced reverse bands—gears heat treated and hardened by modern scientific methods—automatic lubrication and a housing covering every moving part.

**"The gear with the unbroken main shaft"**

*Every motor boat owner should insure his outfit against all dangers with a Baldrige. Let us give you the inside facts about reverse gears and reverse gear construction, as explained fully in the Baldrige book (free). Write for it today. It will give you some sound logical information.*

**THE BALDRIDGE GEAR CO., 238 Mt. Elliott Ave., Detroit, Mich.**

**Export Office  
47 Broadway  
New York City, U. S. A.**



The Baldrige Reverse Gear is standard equipment on a large number of the leading American and European marine engines. When you select an engine, ask about the Baldrige. If it is not regularly furnished with the engine you buy, ask to have it included. You can have it, if you insist.



# PEERLESS

## THE NEW "PEERLESS" TWENTY-FIVE

### A PERFECT CRUISING ENGINE

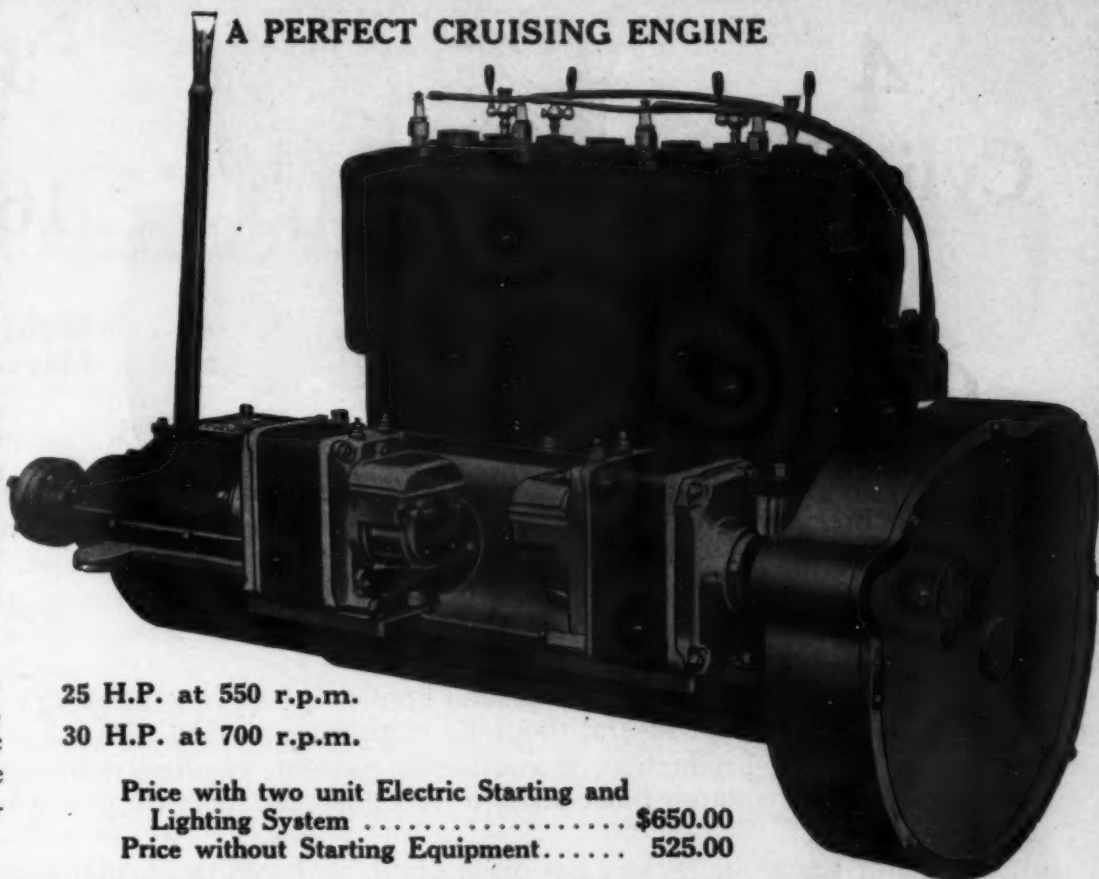
The new "Peerless" Twenty-Five is the most modern of all small power plants. This engine is especially adapted for cruising and moderate speed run-about service. Every moving part is enclosed. It is equipped with a two unit electric starting and lighting system built in, Detroit force feed oiler. Schebler or Stewart carburetor, plunger water pump and Atwater-Kent ignition.

Quietness of operation, simplicity, reliability, and beauty of design are exclusive features of the "Peerless" Twenty-Five.

25 H.P. at 550 r.p.m.

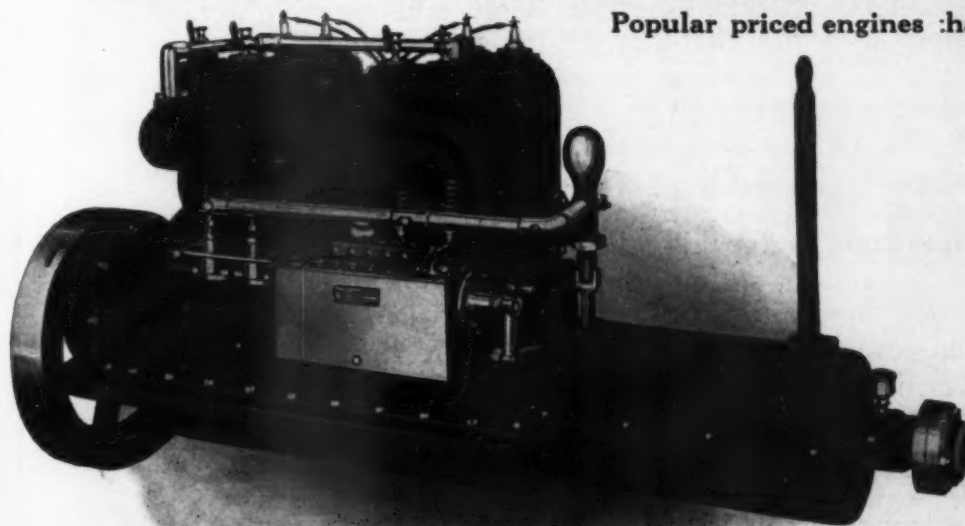
30 H.P. at 700 r.p.m.

Price with two unit Electric Starting and  
Lighting System ..... \$650.00  
Price without Starting Equipment..... 525.00



## HEAVY DUTY AND STANDARD MEDIUM DUTY AND SPEED MODELS

Popular priced engines that will meet every requirement



The standard line of Peerless engines is too well-known to need a detailed description. They have proven their true worth and reliability by 3 years of actual service, in all types of boats. The heavy duty models are adapted to service in the larger cruisers, tugs, work-boats, etc., while the standard medium duty and speed models will make a desirable and economical power plant for all types of boats ranging from the small runabouts to a 40' cruiser. The 2-cyl. models are especially well adapted for fishing and work-boat service. All Peerless models are simple, reliable and inexpensive.

### 1916 Prices

4 Cyl., 40-50 H.P. ....	\$625.00	2 Cyl., 20-24 H.P. ....	\$395.00
4 Cyl., 25-35 H.P. ....	450.00	2 Cyl., 12-16 H.P. ....	290.00
4 Cyl., 16-20 H.P. ....	375.00	2 Cyl., 8-10 H.P. ....	265.00

# Peerless Marine Motor Co.

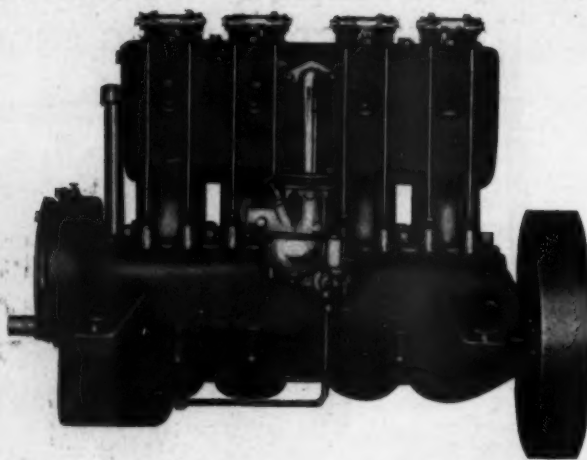
BUFFALO, N. Y., U. S. A.

LOOK FOR US AT THE MOTOR BOAT SHOW, SPACE G., NEAR MAIN ENTRANCE

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.

# \$150-MORTON-\$150

4  
Cylinder  
4  
Cycle



3 1/2 x 4  
16 H. P.

High tension Dual  
Magneto Equipment  
\$35.00

There are thousands of forms of advertising, but the enthusiastic word-of-mouth boost from the satisfied user weighs more than a barrel of printers' ink.

Owners of many marine engines damn them with faint praise.

During 1915, less than \$100 has been spent in advertising the \$150—MORTON—\$150 motor—but boosting owners have sent us a very satisfactory volume of business.

No one has a monopoly on the knowledge of how to design a gasoline engine—any one of several thousand engineers can turn the trick.

BUT, the production of a self-selling engine requires manufacturing experience plus enough horse sense to recognize the fact that good workmanship pays.

For years our factory has made crank shafts and cam shafts for the automobile trade.

The manufacturers of Hupmobile, Chevrolet, Cole, and other high-grade motor cars may be trusted to see to it that they are not short-changed on workmanship.

The same painstaking attention is given to every detail of construction in the \$150—MORTON—\$150 motor as is applied to the best automobile ever made.

In short, we know how to make marine motors, and we flatter ourselves that we have brains enough to know that making them right is water on our wheel.

A marine engine is unlike a spring bonnet—the design does not necessarily have to be changed each year.

In machinery, changes without improvements are mere “bunc.”

There has, however, in recent years been one vitally important improvement made in gas engine design, *i.e.*, overhead valve construction.

It gives 15% more power for the same bore and stroke than is possible with side-valve construction.

This improvement is incorporated in the 1916 model of the \$150—MORTON—\$150 motor.

We KNOW that this motor is the most high-grade, clean-cut, carefully-manufactured, up-to-the-second piece of machinery ever offered to motorboat users.

It develops 16 actual brake horsepower at 1,000 R.P.M.

**MORTON MOTOR COMPANY,** 46 EAST LAFAYETTE AVE.  
DETROIT, MICH.





Triplex Stern Light



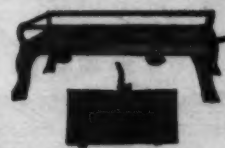
American Automatic Fog Signal



Patterson Trap Ventilator



Pyro Alcohol Stove



Pyro Alcohol Stove With Tank



Crescent Yacht Range



Thief Proof Gasoline Filling Caps for Tanks



Durkee Pattern Port Light



Crescent Connecting Links



'Reliable' and 'Anchor' Dry Fire Extinguishers



Durkee Launch Wheel



Crescent Ball-Bearing Anchor



Durkee's Bilge Pump



Durkee's Grasmere Factory



Andrade Windlass

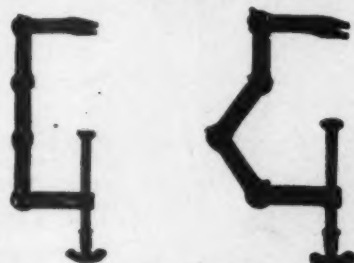


Curtiss Capstan

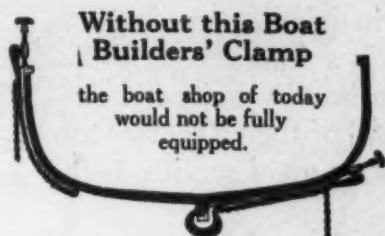
## ALWAYS SOMETHING NEW AT DURKEE'S

ASK YOUR DEALER to get You PRICES ON CLAMPS!!!

We have just published an 8-page pamphlet which describes the finest and most satisfactory proven tools in this line.



Universal "Crescent" Clamp



McKenzie Boat Builders' Chain Clamp

We show above the "Crescent," just placed on the market—detachable sections show how it can be used anywhere, and the "McKenzie" Chain Clamp—invaluable in boat building. Pamphlet illustrates how one man can plank and rivet without a helper. Send for this new publication and prices—it tells complete story.

### Now is the Time to Prepare Your List

of needs, and by looking ahead avoid the rush at the last minute. There is no better time for the wise boat owner to make a start than during these February hours. We have put a few of many things we make as a border to this advertisement—this may lead to a suggestion as to some want that must be filled before boats are ready to go into commission, and if you don't know just what you do want, we will gladly send you some practical, helpful suggestions and names of dealers—it's a pleasure to be of service.

## CHAS. D. DURKEE & CO.

Incorporated

Manufacturers of MARINE HARDWARE and  
MOTOR BOAT SPECIALTIES

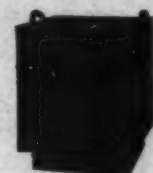
2 and 3 South Street

NEW YORK CITY

#### FACTORIES:

Brass and Galvanized Goods, - Grasmere, S. I., New York City  
Machine Shops, Mop, Broom and Flag Factories - New York City

Our 1,100-page catalogue sent on receipt of 25 cents to cover delivery, or through your dealer free.



Stove Oven



Durkee Log



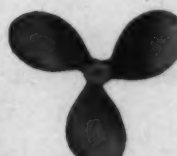
Kay Log



Crescent Ammeter



Crescent Quadrant Tiller



Crescent Propeller

# "Some Clutch"

MOTOR  
BOATING

WE are accustomed to hearing compliments for Joe's Reverse Gears, but when a practical engineer takes a big gear apart and then puts down "Some Clutch" in his log we consider it about as expressive as anything he could say.

It doesn't matter what size or type of boat you have—whether it is a featherweight high speed hydroplane or a heavily built commercial boat, there is a model of Joe's Reverse Gear that will give you just as good service as the one in the Chomly.

Joe's Duplex Drive, the only heavy duty gear with the same speed ahead and astern that does not depend on lock gear teeth for forward drive. The gearing is quadruplex and the duplex friction drive takes the strain off the gearing on the go-ahead. Particularly adapted to *tow boats, ferry boats and paddle wheel boats*. Also for high power speed pleasure or racing craft.

*Write today for complete catalog*

## The Snow & Petrelli Mfg. Co.

MANUFACTURERS OF

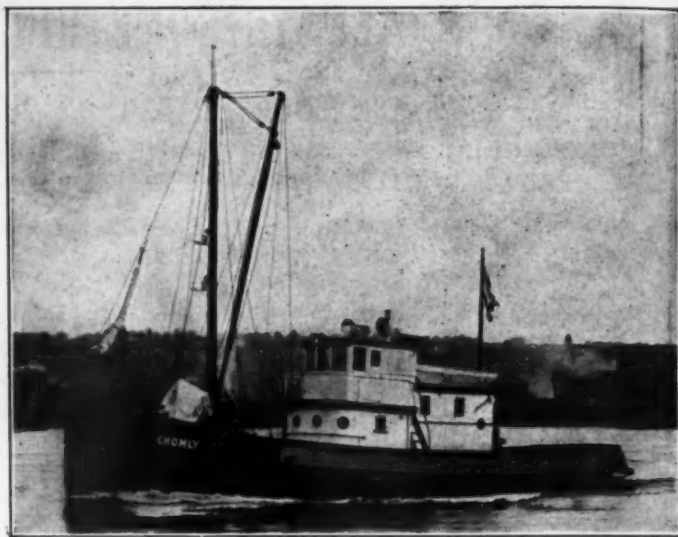
Reversing Gears, Rear Starters, One-Way  
Clutches, Etc.

154 Brewery Street  
New Haven, Conn. U. S. A.

See You at New York Show Main Floor

### AGENTS

J. King & Co., 10 Church Row, Limehouse, London, Eng.  
L. H. Coolidge Co., Seattle, Wash.  
Gasoline Engine Equipment Co., 85 Liberty St., New York.  
Wood, Vallance & Leggat, Vancouver, B. C.  
Shea Sales Co., Montreal.  
Thompson Engine & Launch Co., Foot Charles St., Baltimore.  
A. R. Williams Mchy. Co., Toronto.



The Chomly 75 ft. x 18 ft. x 8 ft. Diesel Motor and No. 172  
Joe's Duplex Drive Gear

THE NEW LONDON SHIP AND ENGINE CO.  
GROTON, CONNECTICUT

September 20, 1915.

SNOW & PETRELLI MFG. CO.,  
New Haven, Conn.

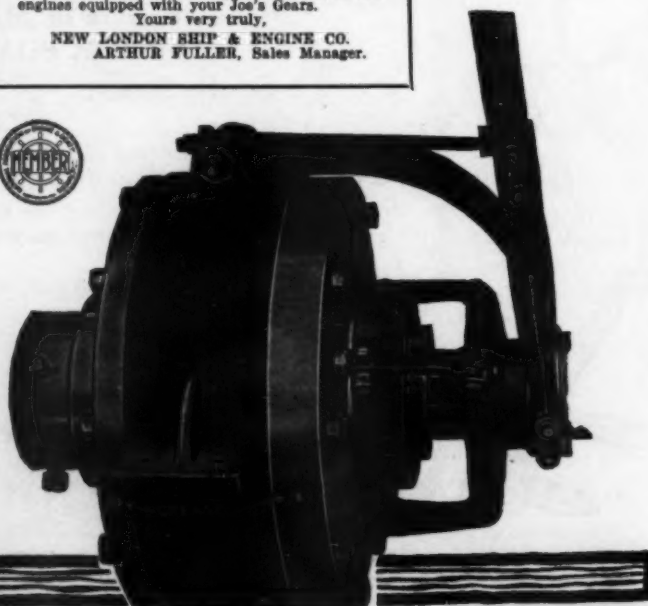
Gentlemen:—In regard to the service given by your gears in connection with our Niseco Diesel engine installations in the cannery tender "Warrior," cannery tender "Chomly," fishing schooner "Manhasset," yacht "Idealla," and Company work boat "Niseco," state that your clutches have been subjected to severe tests and have given entire satisfaction in each case.

The following is an extract from the engineer's log of the "Chomly" after an 800-mile run from Seattle, Wash., to Chomly, Alaska:

"Examined clutch while in Chomly. Took it all apart and found everything fine.  
Some Clutch."

(Signed) STANLEY MILLER, Eng'r.  
We have equally good reports from all of our engines equipped with your Joe's Gears.

Yours very truly,  
NEW LONDON SHIP & ENGINE CO.  
ARTHUR FULLER, Sales Manager.

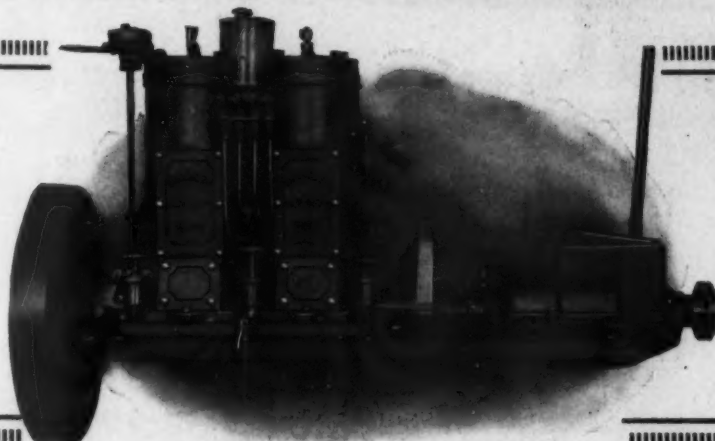




# NOT at the Show

**Why?** We can't spend several hundred dollars on entertainment at the New York Show (which of course you would finally pay for) and still sell the **\$150 12-15 H. P. SMALLEY \$150**

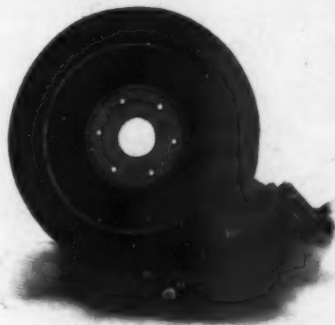
America's OLDEST two-cycle marine engine. Our age guarantees you fair dealing, satisfactory fuel economy, greatest flexibility and easy starting, or we would be forced to change our type of engine, like other engine builders have done. Only genuine Quality and Honesty endure.



2-Cylinder, 2-Cycle  
4 1/4" Bore, 4 1/4" Stroke  
Non-backfiring  
Flanged Flywheel  
Exhaust Pipe Ell-Cap  
True Marine Engine—No Discard  
Gasoline or Kerosene

12-15 H.P.

## The Season's Greatest Bargain



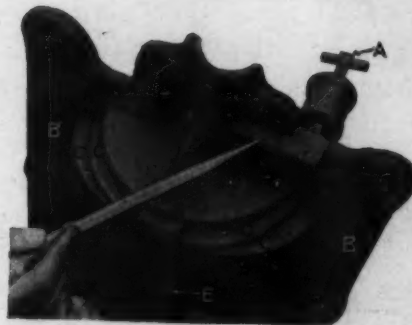
Flanged Flywheel

### Can You Beat These Specifications at \$150?

Flanged fly wheel, exhaust pipe ell-cap with water connections, jump spark ignition (Make & Break extra), rotary pump (plunger pump extra), drop forged connecting rods with interchangeable babbit bushing on crank pin and bronze on piston pin, Schebler carburetor, Heintz rotary timer, water jacketed exhaust pipe, four large hand hole plates, all moving parts ground, large four feed oil cup, flanged fly wheel, cut brass timer and pump gears, Aluminum gear guards—removable countersunk cylinder heads, base liners for main journals, cylinder head jack screws, priming cups, relief cocks, navy screw handle grease cups, propeller coupling, turning lever, wrenches, etc.



Exhaust Pipe Ell-Cap



Main Journal Grease Leads

AGENTS:—SOME TERRITORY STILL OPEN

**SMALLEY GENERAL COMPANY, 1601 TRUMBULL STREET, BAY CITY, MICHIGAN**

# A TYPE for every



Regular  
7/8" 18  
S.A.E.  
Long  
Type

Curtiss  
Aeroplane  
Type

and Princess  
Automobile  
Equipment

Metric  
Long Type  
Mack

and  
Sauer  
Truck  
Equipment



## SPLITDORE

COMMON SENSE



1/2" O.E. Long  
Special Type for  
Ford Cars

Standard 1/2" O.E.  
Overland and Pullman  
Equipment

Metz Equipment

Automobile  
Metric Type

## AND NO GASOLINE MOTOR IS COMPLETE



# GASOLINE MOTOR

Standard  
S. A. E.  
7/8" C. E.



Franklin  
Equipment

Heavy Hex  
Open End



Buick  
Type

Jeffery,  
Morton,  
Vim and  
Wichita Falls  
Truck  
Equipment



# SPARK PLUGS

COMMON SENSE



Excelsior  
Motorcycle  
Equipment



Pope  
Motorcycle  
Equipment



S. A. E. 7/8" O. E.  
Indian  
1916 Equipment

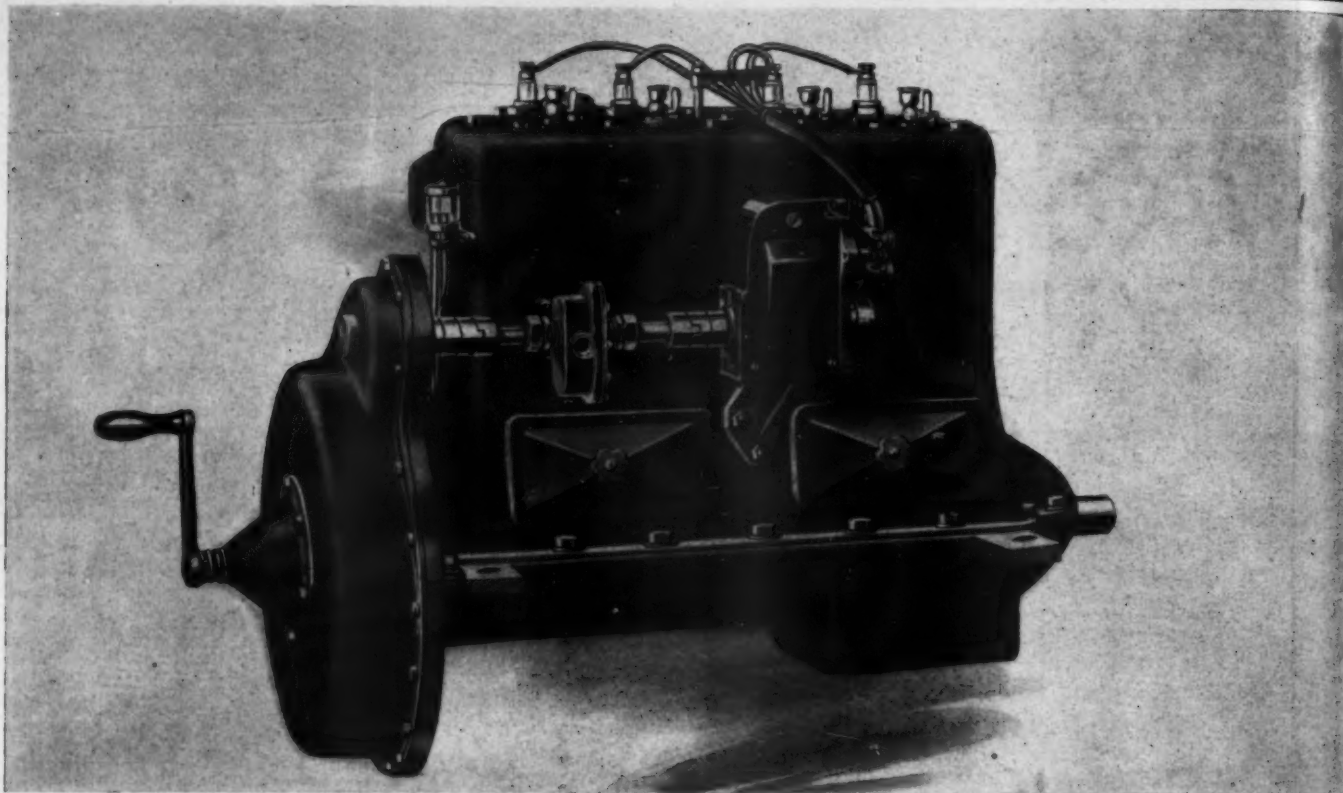


Standard  
Motorcycle Type



Indian Metric Type  
1914-15 Equipment

# WITHOUT SPLITDORF SPARK PLUGS



## A Combination of Power, Speed, Accessibility and Flexibility

This new 4-cylinder, 4-cycle L-A Motor has all the essentials that make for greatest possible efficiency. Designed for service in family pleasure boats, work boats and speed boats from 20 to 35 feet in length. It is strong and sturdy enough to endure in the hardest of service, yet there is not an unnecessary pound of weight in its make-up.

Cylinder  $3\frac{3}{4} \times 4\frac{1}{2}$ ". It develops 14 h.p. at 750 r.p.m. with a range of speed from 200 to 1500 r.p.m. which gives wonderful flexibility.

Extremely accessible. Removable cylinder head. Large hand hole plates in base, entirely unobstructed. Fly-wheel and all moving parts enclosed.

New Dixie Magneto is used which gives an extremely hot spark at low speeds. Rotary gear water pump. Splash and direct oiling system.

# LA Marine Motors

### For Every Purse and Purpose

The line of L-A Marine Motors for 1916 is exceptionally complete and includes models suitable for every type of boat from 14 to 35 feet in length—canoes, rowboats, pleasure boats, work boats, speed boats and cruisers.

L-A Rowboat Motors are furnished with flywheel magneto or battery ignition. A compact, powerful little outfit for any type of rowboat.

L-A Canoe Motors are furnished in both one and two cylinder models with propeller and rudder equipment for permanent installation.

L-A 2-cycle motors are made in both single and double cylinder models, from  $2\frac{1}{2}$  to 12 h.p. They are extremely simple in their design and absolutely free from trappy fittings. Powerful, reliable and economical.

#### Sold on Thirty Days' Trial

You don't have to do any guess-work or run the slightest risk when you select an L-A engine for your boat.

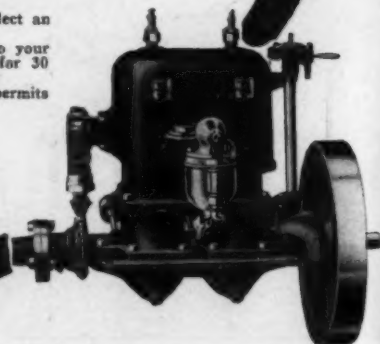
Our liberal selling plan protects you fully and leaves the final decision up to your own good judgment. Select any engine from our catalog—put it in your boat for 30 days, and let the engine itself prove its worth under actual working conditions.

This is a fair and square offer that positively insures your satisfaction and permits you to see for yourself the big value that L-A engines offer.

Send today for our new 1916 catalog and complete details.

### Lockwood-Ash Motor Co.

1301 Horton Ave.  
JACKSON, MICH.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.*



# GEO. B. CARPENTER & CO



## Bang!! goes the gun and we're off!

to a corking start in the 1916 regatta. Never were we better equipped—never so eager to win as we are now.

*Watch us, pull for us, bank on us,* and we will do our level best to make good for you.

### When you think Boat Supplies—think Carpenter

Send for our No. 102 Marine Catalog if you haven't a copy already. Send fifteen cents in stamps to cover postage and we will refund that amount on your first order.

*New 1916 net price list ready about March 1*

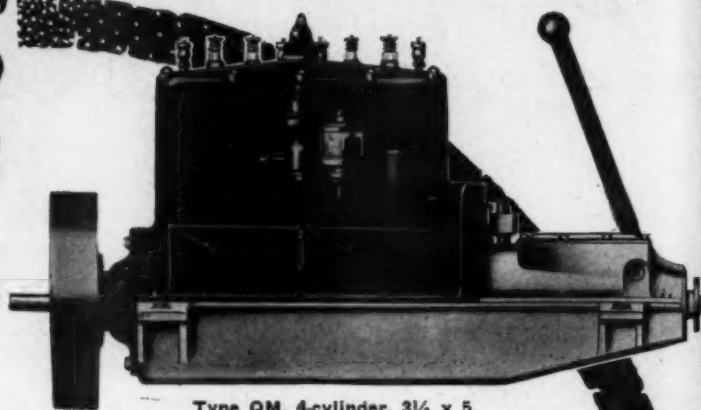
## GEO. B. CARPENTER & CO

430-440 Wells Street, Chicago



## There's Real 'Pep' in These Motors

THE eager enthusiasm of youth, the untiring energy of perfect health, are typified in the magnificent flexibility and reserve power of these snappy models. "Sweet running"—that's what motor experts say of them. Their shipshape, compact design, with all working parts enclosed, yet easily accessible; the perfect balance of reciprocating parts; their smooth, consistent performance under all loads; all these points of superiority combine to make them unique. Be sure to see these

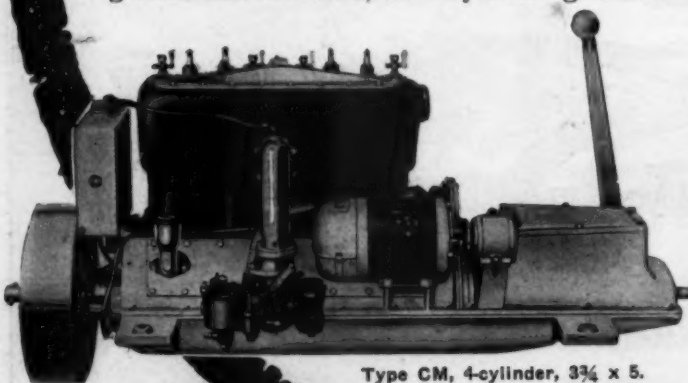


Type QM, 4-cylinder,  $3\frac{1}{4}$  x 5.

## Wisconsin Motors

CONSISTENT

at the Show. Inspect the materials that go into all Wisconsin Motors, the way shafts are ground and balanced, the way bearings are fitted. Note how the Wisconsin lubricating system keeps all bearings flooded with oil, at whatever angle the motor is running. Each of the many types of Wisconsin Motors—all four cycle—four, six and eight cylinders, represents the highest development of marine motor design and construction. If you haven't a Wisconsin catalog, write for specifications of the type you want.



Type CM, 4-cylinder,  $3\frac{1}{4}$  x 5.

**Wisconsin Motor Mfg. Co.**

Sta. A, Dept. 302

Milwaukee :: Wis.

New York Branch, 50 Church St.  
T. M. Fenner, Factory Representative.  
Pacific Coast:  
Earl P. Cooper Co., 333 W. Pico St., Los Angeles, Cal.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.*



# APELCO

THE PIONEER OF  
**MOTOR BOAT**  
ELECTRIC LIGHTING SYSTEMS

Here is an installation of an APELCO electric lighting system on John R. Fell, Jr.'s, Dorothea, a craft of the luxurious type well known in Newport waters.

The APELCO Systems are furnished in three different sizes, known as Model B-1, B-2 and B-3.

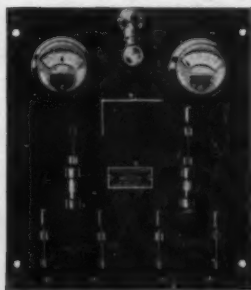
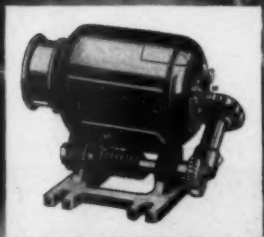
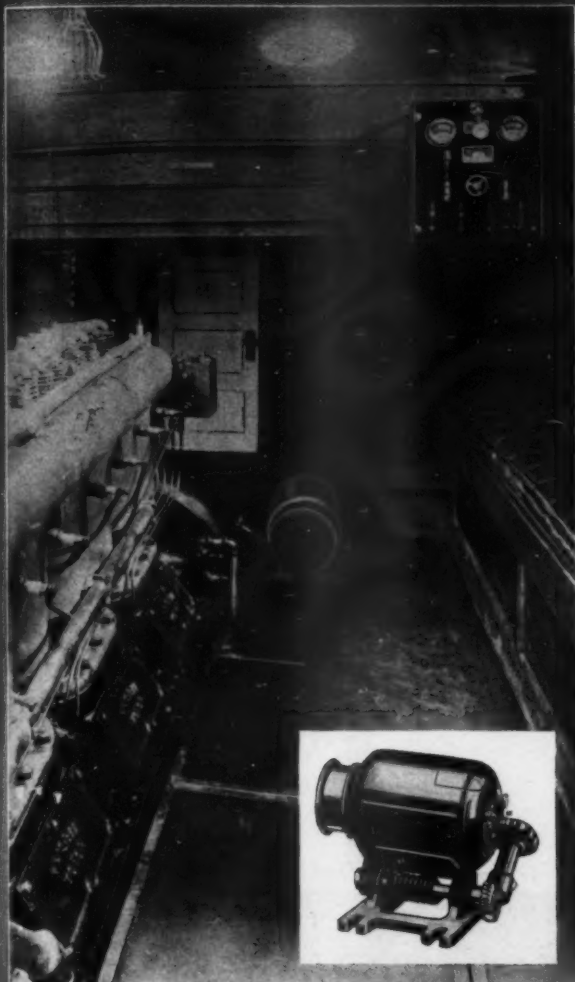
APELCO STARTING UNITS, suitable for certain motors, can be supplied. In writing for information, send with your letter bore and stroke, h.p., r.p.m. and number of cylinders of motor for which starting unit is intended.

## The Apple Electric Co.

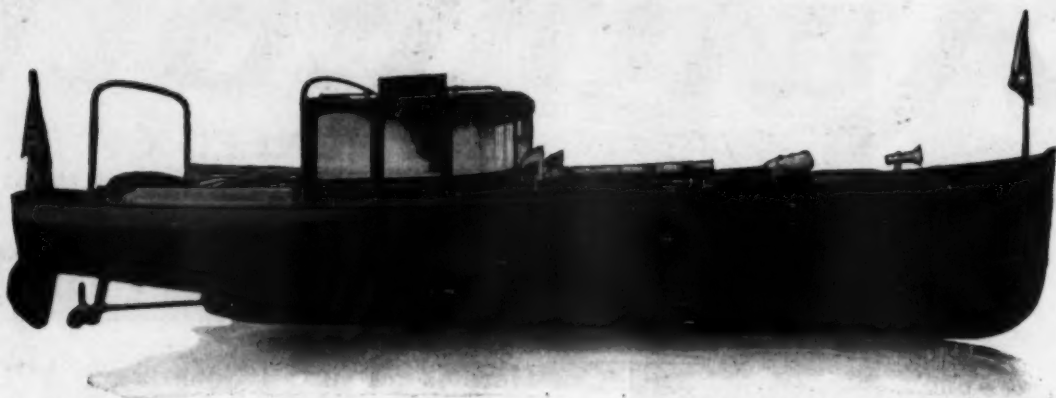
Factory, Newark, N. J.

U. S. A.

APELCO B-2 Motor Boat Electric Lighting System



# Speedway



*Showing profile of SPEEDWAY Coupe Yacht Tender*

## THE MODERN COUPE YACHT TENDER

A feature of the SPEEDWAY exhibit at the Motor Boat Show.

Fast, dry, and possessed of every feature that can help give perfect comfort and security to the owner and party.

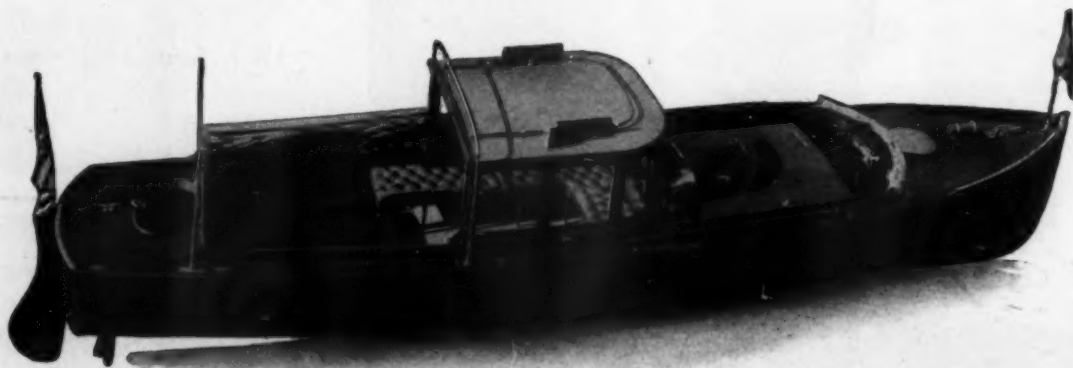
Built in six sizes, 23 to 35 feet in length, with speeds of 15 to 25 miles per hour.

Thoroughly up-to-date in its provisions for comfort, and designed and built with careful study and practical knowledge of yacht tender service.

The fact that so many well-known yachts are carrying SPEEDWAY Coupe Yacht Tenders is an indication of their popularity among the most discriminating yacht owners.

## 1916 Announcement Catalog

Our new catalog, announcing the 1916 SPEEDWAY products, giving illustrations and descriptions of our new series of engines and boats, is now ready for distribution. A copy will be sent you on request.



*Showing interior of SPEEDWAY Coupe Yacht Tender*



**Gas Engine & Power Company and  
Charles L. Seabury & Co., Consolidated**

Department A

Morris Heights

New York City





# The New "Automatic" Cruiser Engines

MOTOR  
BOATING

It has long been our ambition to build a series of cruiser and yacht engines, to equal in reliability the famous Automatic Heavy Duty Engines. At last we have accomplished our purpose.

The new Automatic Cruiser Engines are built the Automatic way. We have gone the limit in the design of this new type. The reputation of our Heavy Duty models was too valuable to risk on anything less than the best that could be produced.

We have been more than three years designing and developing this cruiser type. It has been tried out in all kinds of service, under the eyes of our engineers and in the hands of owners. The public announcement was deferred until we were sure.

In these engines we use independent "L"-type cylinders with large mechanical valves which can be reground and seated without removing the cylinder head. All bearings are removable, extra large and made of special bronze. The Oiling System is something absolutely new in the marine field—entirely enclosed, an integral part of the engine itself. Jump-spark ignition. Any make of magneto and carburetor supplied at option of the purchaser.

	Four Cylinders	Six Cylinders
5 x 7" .....	30 H.P.	45 H.P.
5½ x 7" .....	40 H.P.	60 H.P.
6⅛ x 8" .....	50 H.P.	70 H.P.
7½ x 9" .....	70 H.P.	105 H.P.
8½ x 10" .....	100 H.P.	150 H.P.

Speeds, 400 to 100 R.P.M. Ratings are based on 800 ft. piston speed per minute.

Automatic Heavy Duty Engines, 3 to 250 H.P.

DON'T FAIL TO SEE THESE ENGINES AT THE  
NEW YORK MOTOR BOAT SHOW

Write today for catalogs, mentioning in which type you are interested.

## The Automatic Machine Company

[BRIDGEPORT, CONNECTICUT, U. S. A.]

Agents and Distributors in Every Part of the Globe



# “What You Need Are McQUAY- NORRIS **LEAK-PROOF** PISTON RINGS”

That's what any man who understands motors will tell you when you are having power or carbon troubles.

He knows that loss of power, poor compression, excessive carbon, waste of gasoline and oil are due to the worn-out, leaky piston rings.

When your boat is out for overhauling put in McQuay-Norris **Leak-Proof** Piston Rings.

They will prove an investment of equal permanence with your motor. They will pay for themselves in saving of gas and oil.

All good supply houses, repair shops and marine stores have them in stock.

Send for FREE booklet:—"To Have and to Hold Power"—the standard handbook on gas engine compression. It tells what **Leak-Proof** efficiency means. Write Department B.

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**McQUAY-NORRIS MANUFACTURING CO., St. Louis, U. S. A.**

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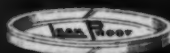
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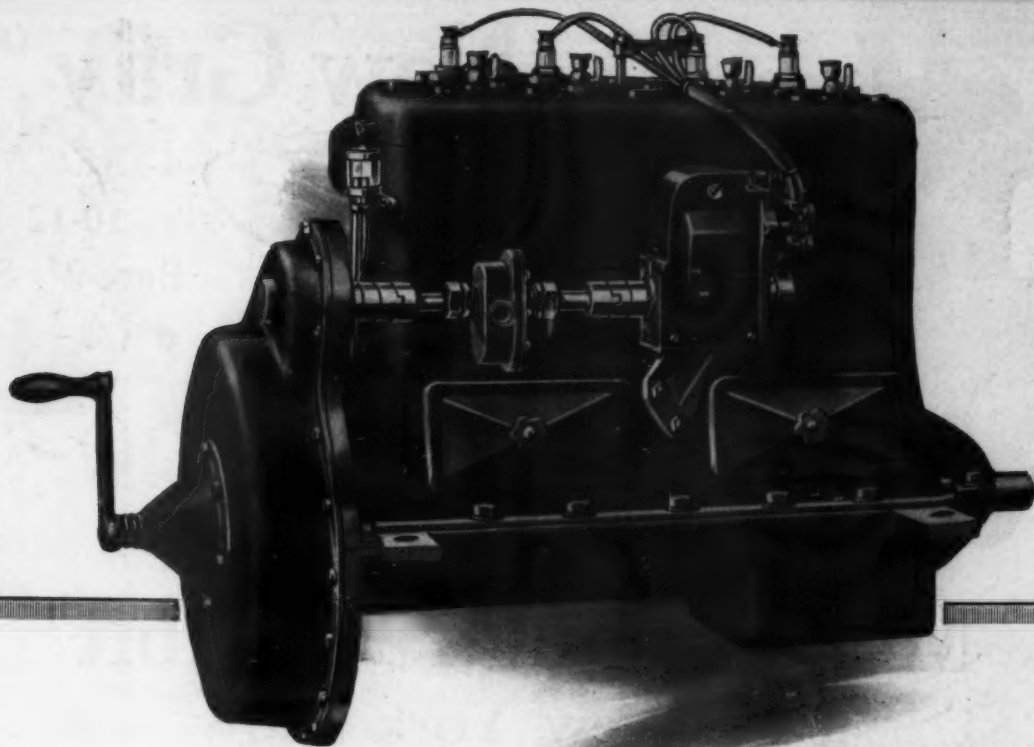
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## The New MOTORGO Four Cycle

*An All-Enclosed Engine of the Latest Up-to-Date Construction*

If you have a pleasure or speed boat which you think deserves the best little power plant you can buy for it, give this new MOTORGO four cycle engine a critical and searching examination that will bring out all its good points. We believe it is without question the best design that has ever been developed in a marine motor of this size and are confident you will find it just the power you want for your boat.

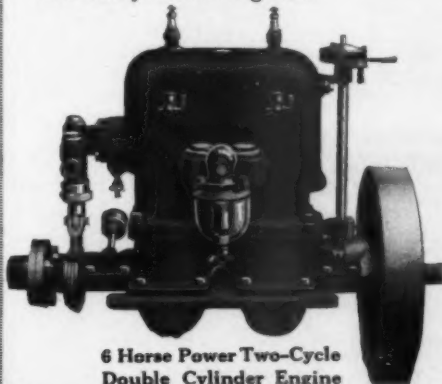
Every moving part is enclosed, insuring the utmost cleanliness and quietness. The unit casting means compactness, endurance, strength and freedom from vibration. The big side plates make the crank case and bearings most accessible. Cylinder head is removable. Lubrication is by splash with plunger pump forcing oil to all bearings.

The complete and high grade equipment supplied with this engine includes high tension magneto, Schebler carburetor and rotary water pump. Speed range is from 200 to 1500 R.P.M. with its normal rating of 14 H.P. easily developed at 750 R.P.M. Bore  $3\frac{3}{4}$  in., stroke  $4\frac{1}{2}$  in. Weight complete is only 385 lbs.

*Write us at once for full specifications and price on this new MOTORGO Four Cycle*

## Motorgo Two-Cycle Engines

Motorgo Two-Cycle Engines have been in use for over ten years and have demonstrated their superiority over other engines costing even double their price. The best material is used in their construction; the workmanship is high-grade in every respect. All parts are accurately machined and are absolutely interchangeable.



6 Horse Power Two-Cycle  
Double Cylinder Engine

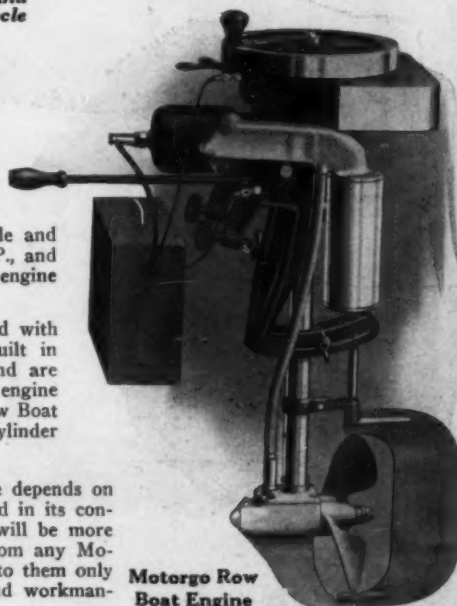
**\$79<sup>95</sup>** with Schebler Carburetor  
and full Fresh Water  
Equipped.

These engines are built in several single and double cylinder models from  $2\frac{1}{2}$  to 8 H.P., and priced from \$36.95 to \$94.75 including full engine equipment.

Motorgo Row Boat Engines are supplied with jump spark ignition or with magneto built in the flywheel as a part of the engine, and are guaranteed equal to any similar rowboat engine on the market. Our Inboard Canoe or Row Boat Engines are built in single and double cylinder models of 2 and 4 H.P. respectively.

The service you get from a boat engine depends on the design of the engine, the material used in its construction and the way it is made. You will be more than satisfied with the service you get from any Motorgo Engine you buy for we have put into them only the highest quality of design, material and workmanship.

*Write today for our catalog 90M75 of Motorgo  
Engines, Reverse Gears and Equipment*



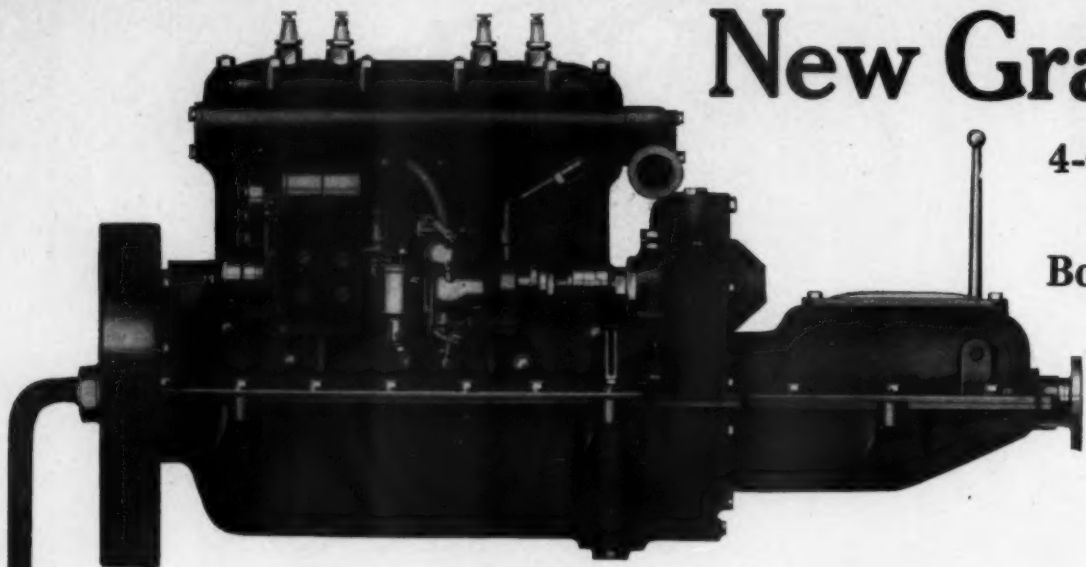
Motorgo Row  
Boat Engine

**\$38<sup>50</sup>** Complete with  
Battery Equip-  
ment.

# Sears, Roebuck and Co., Chicago, Illinois

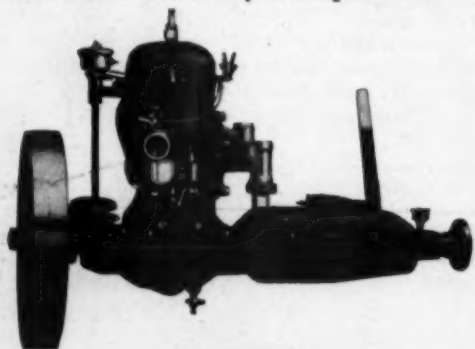
# New Gray "D-Jr."

4-Cyl. 4-Cycle  
10-12 H. P.  
Bore 3" Stroke 4"



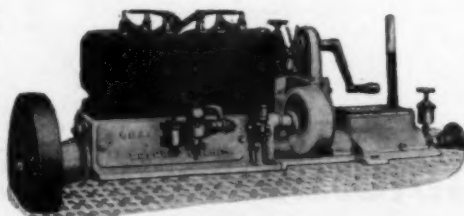
## Most Popular Exhibit at the New York Show

**B**ECAUSE the Gray Line is complete in both 2 and 4-Cycle marine motors—3 to 50 H. P., 1 to 6 cylinders—thus giving you the selection of a *guaranteed* Gray Motor for *your* boat. The newest addition to the complete Gray line is the New Model "D-Jr." 4-Cycle, manufactured in two sizes—2-cyl., 5 to 6 H. P., and 4-cyl., 10 to 12 H. P. (cut of which is shown above). "D-Jr." will be exhibited to the public for the first time at the New York Motor Boat Show. Watch for it—it is bound to be one of the biggest sensations of the year. Its price is by far the lowest ever established by a responsible marine motor manufacturer on an engine of its power and quality.

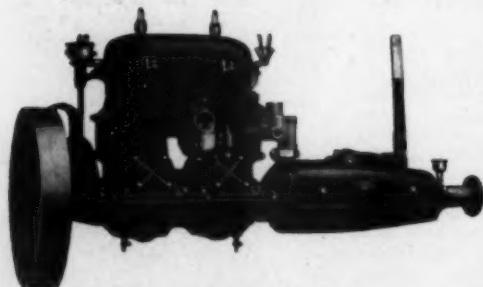


2-CYCLES  
Single Cylinder Model "U."  
Two Sizes—3 and 5½ H. P.

All 1916 Grays represent the very latest ideas in marine engine construction and are backed up and guaranteed by a responsible concern. Gray service stands back of every Gray motor sold.

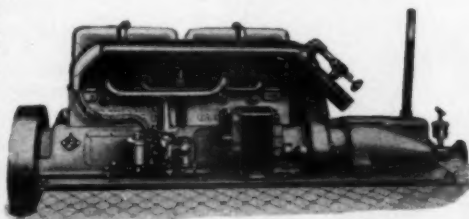


MODEL "D"  
Two sizes—2-Cyl. 10 and 12 H. P.  
4-Cylinder 20 to 24 H. P.



2-CYCLES  
Double Cylinder Model "U."  
Two Sizes—6 and 11 H. P.

Visit the Gray Exhibit at the show. Examine the new models as unit power plants and bare engines. Know the "how" and "why" of the world's standard marine motors. These will be open for inspection.



MODEL "C"  
Two Sizes—4-Cyl. 30 H. P.;  
6-Cyl. 40 to 50 H. P.

Write for catalog including description of new "D-Jr."

Gray Motor Company, 274 Gray Motor Bldg., Detroit, Michigan



## *Look for the Fay & Bowen Exhibit!*

AT THE

# National Motor Boat Show

*New York, Jan. 29 to Feb. 5*

WE invite especial attention to our exhibit at the National Show in the Grand Central Palace in New York in space A-1 opposite the main entrance. We shall have on view a full line of our engines in both our four-cycle and our two-cycle types, also two of our complete power boats, "runabout" style, with full equipment. The prominent feature of our exhibit will be a

## New Model 30-ft. Raised Deck Runabout



From designs by M. M. Whitaker and powered with a

## Fay & Bowen Six-Cylinder Four-Cycle Engine

This is an ideal power boat for the most discriminating. High and dry, roomy and seaworthy.  
We look forward with pleasure to meeting you at the Show.

**FAY & BOWEN ENGINE CO.,** 104 Lake Street  
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Made for Canada by the St. Lawrence Engine Co., Ltd., Brockville, Ontario

# KERMATH

## America's Standard Four Cycle Engine

### CONFIDENCE

**C**ONFIDENCE is a state of mind. It is induced by anything which has proven by its past performances that you may rely implicitly upon its future action. Without confidence nothing is worth while.

You have confidence in your bankers, and entrust your money to their care. You have confidence in your trusted employees and leave big undertakings to their judgment. You have confidence in your marine motor when it serves you perfectly, through thick and thin, year after year.

Men who know most about marine power plants today place their utmost confidence in Kermath Engines. They have seen men trust their lives and the lives of their families in open, dangerous waters where a good power plant is essential. They know that it was confidence in their Kermath engines that led these owners to go out where others, with equally as good boats, stayed behind.

Ask any man who owns a Kermath and see how much farther his confidence extends; see what he has to say about his dealings with the "factory behind the engine." He has equal confidence in the Kermath Company because he knows from experience that "Service to the Customer" is our first aim. He knows that we produce an honestly made engine. One that is built to "endure" and make the name "Kermath" stand foremost when you think marine engine, and to perpetuate a business in which \$100,000 is invested to produce high grade marine engines.

It is our earnest desire to produce honestly made engines and it is absolutely necessary for us to do this to have the continued patronage of the best boat builders, dealers and consumers throughout the world.

"Our necessity is your motor insurance," and to protect our factory and investment we continue to be alive, produce the most modern design, give greatest values, and build engines that "make good" because they are "made good."

### Your Kermath Will Satisfy You

Investigate the Kermath before you select the power equipment for your boat. You can get a Kermath standardized four cylinder, four cycle engine of the latest accepted construction, in 12, 16 or 20 H.P. Investigate Kermath quality, popularity and prices. Interview Kermath owners and let us submit all our data on the subject.

If you want a power plant you can have confidence in, you will find it in the Kermath.

Write us today for complete illustrated catalog.

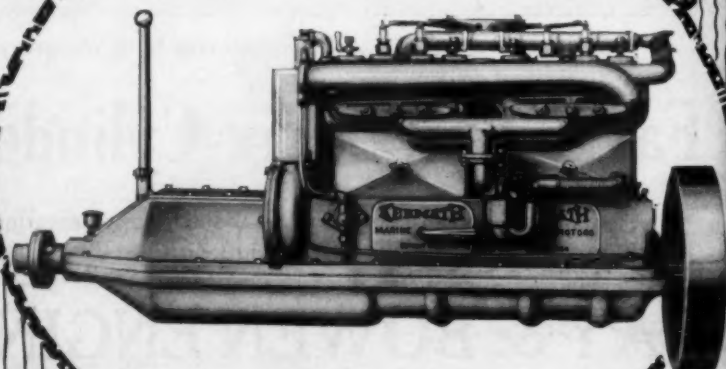
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